

SPECIFICATIONS FOR

**USC Salkehatchie Science Building Renovation
WESTERN CAROLINA HIGHER EDUCATION COMMISSION
Walterboro, South Carolina**

Project Number: H38-I319



June 6, 2012

Prepared by

**DRAKEFORD ARCHITECTS
120 North Main Street
Sumter, South Carolina 29150
Phone: (803) 774-2000
Fax: (803) 774-2003
drakefordarchitects@sc.rr.com**

SET NO. _____

TABLE OF CONTENTS

PROJECT NUMBER: H38-I319

PROJECT NAME: USC Salkehatchie Science Building Renovation

SECTION

| | |
|---|----|
| Table of Contents (<i>insert numbers of pages</i>)..... | 4 |
| Invitation for Bids (SE-310)..... | 1 |
| Instructions to Bidders (AIA Document A701 – 1997 Edition *)..... | 1 |
| 00201-0SE Standard Supplemental Instructions to Bidders | 10 |
| USC Supplemental General Conditions for Construction Projects | 3 |
| Bid Bond (AIA A310)..... | 1 |
| Standard Bid Form (SE-330)..... | 4 |
| Standard Form of Agreement between Owner and Contractor (AIA Document A101 – 2007 Edition*)..... | 1 |
| 00501-0SE Standard Modifications to AIA A101-2007 | 3 |
| <i>[Insert supplemental project specific modifications to AIA A101 if needed.]</i> | |
| General Conditions of the Contract for Construction (AIA Document A201 – 2007 Edition*)..... | 1 |
| 00811-Standard Supplementary Conditions | 25 |
| (Supplement to AIA Document A201-2007 Edition General Conditions of the Contract) | |
| <hr/> | |
| <i>[Insert additional, project specific, supplementary conditions if needed.] (For the above AIA Documents do not “edit” the document; use them as cover sheets and attach the OSE modification documents.) (*Insert either an original AIA document or a "replacement page." – See Chapter 5.)</i> | |
| Performance Bond (SE-355)..... | 2 |
| Labor and Material Payment Bond (SE-357)..... | 2 |
| Contractor’s One Year Guarantee | 2 |

TECHNICAL SPECIFICATIONS

| | |
|------------|--|
| DIVISION 1 | GENERAL REQUIREMENTS |
| 0100 | Conditions, General and Modified |
| 0101 | Scope of the Work |
| 0102 | Contractor's Responsibility |
| 0103 | Approval of Materials |
| 0104 | Errors and Questions |
| 0105 | Materials, Workmanship & Codes |
| 0106 | Temporary Facilities |
| 0107 | Summary of Certificates and Permits to be provided by the Contractor to the Architect. |
| 0108 | Summary of Certificates to be provided by the Owner to the Architect |
| 0109 | Cash Allowances |
| 0111 | Special Conditions |
| 0112 | Inspections Required by Code |
| DIVISION 2 | SITE WORK |
| 0200 | General |
| 0201 | Site Investigation |
| 0202 | Scope |
| 0203 | Demolition |
| 0210 | Clearing of Site |
| 0211 | Layout |
| 0223 | Excavation |
| 0225 | Fills Under Floors and Concrete Pavements |
| DIVISION 3 | CONCRETE |
| 0300 | General |
| 0302 | Storage of Materials |
| 0310 | Concrete Formwork |
| 0320 | Concrete Reinforcement |
| 0321 | Expansion Joints |
| 0322 | Vapor Barrier |
| 0325 | Fiber Mesh Reinforcing |
| 0330 | Concrete |
| 0335 | Placing Concrete |
| 0336 | Protection and Curing |
| 0337 | Finishing |
| 0370 | Concrete Finishes |

DIVISION 4

MASONRY

| | |
|------|---|
| 0400 | General |
| 0401 | Protection of Materials |
| 0402 | Cleaning and Pointing Masonry |
| 0403 | Laying Masonry |
| 0410 | Concealed Base Flashing and Base Flashing Accessories |
| 0412 | Reinforcement |
| 0413 | Mortar |
| 0421 | Brick Masonry |
| 0422 | Concrete Masonry Units |
| 0423 | Masonry Lintel Schedule |

DIVISION 5 METALS

| | |
|------|---------------------------------------|
| 0500 | General |
| 0501 | Materials |
| 0502 | Connections |
| 0503 | Workmanship |
| 0504 | Shop Drawings |
| 0505 | Erection |
| 0506 | Anchor Bolts and Column Base Settings |
| 0510 | Quality Control |
| 0530 | Metal Studs & Joists |

DIVISION 6

CARPENTRY

| | |
|------|---------------------------|
| 0600 | General |
| 0610 | Rough Carpentry |
| 0620 | Finish Carpentry |
| 0660 | Finish Carpentry Material |

DIVISION 7

MOISTURE PROTECTION AND INSULATION

| | |
|------|-----------------------|
| 0700 | General |
| 0780 | Firestopping |
| 0790 | Caulking and Sealants |

DIVISION 8

DOORS, WINDOWS, GLASS AND HARDWARE

| | |
|------|-------------------------------|
| 0800 | General |
| 0820 | Hollow Metal Doors and Frames |
| 0830 | Wood Doors |
| 0871 | Mirrors |
| 0885 | Finish Hardware |

| | |
|------------|--------------------|
| DIVISION 9 | FINISHES |
| 0900 | General |
| 0910 | Suspended Ceiling |
| 0925 | Gypsum Drywall |
| 0928 | Carpet |
| 0965 | Vinyl Cove Base |
| 0966 | Vinyl Accessories |
| 0970 | Resilient Flooring |
| 0990 | Painting |

| | |
|-------------|--|
| DIVISION 10 | SPECIALTIES |
| 1000 | General |
| 1010 | Markerboards, Tackboards, and Tackstrips |
| 1080 | Bathroom Accessories |
| 1081 | Grab Bars |

SECTION 15 PLUMBING AND MECHANICAL

| | |
|-------|---|
| 1500 | Plumbing |
| 15700 | Heating, Ventilation & Air Conditioning |

SECTION 16 ELECTRICAL

| | |
|-------|--|
| 16000 | Electrical Basic Materials and Methods |
| 16721 | Fire Alarm System |

END OF TABLE OF CONTENTS

**SE-310
REQUEST FOR ADVERTISEMENT**

2011 Edition
Rev. 7/20/2011

PROJECT NAME: USC Salkehatchie Science Building Renovation

PROJECT NUMBER: H38-I319

PROJECT LOCATION: Walterboro, 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: \$115,000 - \$175,000

DESCRIPTION OF PROJECT: Renovation of a portion (~1900 SF) of the existing Science building. Includes new finishes, modest wall rearrangement, new MEP. Small and minor business participation is encouraged. Bidders are responsible for obtaining all updates to bidding documents from the USC Purchasing website: <http://purchasing.sc.edu> See Facilities / Construction Solicitation and Awards

A/E NAME: Drakeford Architects

A/E CONTACT: C. Meredith Drakeford, Jr.

A/E ADDRESS: Street/PO Box: 120 North Main Street

City: Sumter

State: SC ZIP: 29150-

EMAIL: drakefordarchitects@sc.rr.com

TELEPHONE: 803-774-2000

FAX: 803-774-2003

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

BIDDING DOCUMENTS/PLANS MAY BE OBTAINED FROM: <http://purchasing.sc.edu>

PLAN DEPOSIT AMOUNT: \$0.00 **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):*

<http://purchasing.sc.edu> (see Facilities/Construction Solicitation & Awards)

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

DATE: 9/4/2012 **TIME:** 11:00 AM **PLACE:** Walterboro Science Building at 807 Hampton St., Walterboro, SC 29488

AGENCY: University of South Carolina

NAME OF AGENCY PROCUREMENT OFFICER: Kay Keisler, Procurement Specialist

ADDRESS: Street/PO Box: 743 Greene Street

City: Columbia

State: SC ZIP: 29208-

EMAIL: kkeisler@fmc.sc.edu

TELEPHONE: 803-777-5812

FAX: 803-777-8739

BID CLOSING DATE: 9/18/2012 **TIME:** 2:00 PM **LOCATION:** Walterboro Main Building Conference Room at 807 Hampton Street, Walterboro, SC 29488 - Bids should be dropped off to Sheila Smoak in the Main Office

BID DELIVERY ADDRESSES:

HAND-DELIVERY:

Attn: Sheila Smoke

USC Salkehatchie

807 Hampton Street - Main Office

Walterboro, SC 29488

MAIL SERVICE:

Attn: Francis Smith

USC Salkehatchie

P.O. Box 1337

Walterboro, SC 29488

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

AIA Document A701 – 1997 Edition
Replacement Page

Original AIA Documents on file at the
Office of Facilities Business and Finance
743 Greene Street, Columbia, SC 29208

OSE FORM 00201

STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS

OWNER: University of South Carolina
PROJECT NUMBER: H38-I319
PROJECT NAME: USC Salkehatchie Science Building Renovation
PROJECT LOCATION: Walterboro, SC

PROCUREMENT OFFICER: Kay Keisler

1. STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS

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

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

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

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

2. MODIFICATIONS TO A701-1997

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

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

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

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

2.4. *In Section 2.1.1:*

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

Insert the following at the end of this section:

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

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

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

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

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

2.2 CERTIFICATION OF INDEPENDENT PRICE DETERMINATION

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

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

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

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

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

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

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

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

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

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

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

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

2.3 DRUG FREE WORKPLACE

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

2.4 CERTIFICATION REGARDING DEBARMENT AND OTHER RESPONSIBILITY MATTERS

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

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

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

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

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

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

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

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

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

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

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

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

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

2.5 ETHICS CERTIFICATE

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

2.6 RESTRICTIONS APPLICABLE TO BIDDERS & GIFTS

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

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

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

2.7. Delete Section 3.1.1 and substitute the following:

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

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

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

2.10. Insert the following Section 3.1.5

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

2.11. In Section 3.2.2:

Delete the words "and Sub-bidders"

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

2.12. In Section 3.2.3:

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

Insert the following at the end of the section:

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

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

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

2.14. Delete Section 3.3.2 and substitute the following:

3.3.2 No request to substitute materials, products, or equipment for materials, products, or equipment described in the Bidding Documents and no request for addition of a manufacturer or supplier to a list of approved manufacturers or suppliers in the Bidding Documents will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least ten days prior to the date for receipt of Bids established in the Invitation for Bids. Any subsequent extension of the date for receipt of Bids by addendum shall not extend the date for receipt of such requests unless the addendum so specifies. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work, including changes in the work of other contracts that incorporation of the proposed substitution would require, shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

2.15. Delete Section 3.4.3 and substitute the following:

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

OSE FORM 00201**STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS****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 may be used for both Alternates and Base Bid Work if Alternates are accepted.

2.22. Delete Section 4.1.6 and substitute the following:

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

2.23. Delete Section 4.1.7 and substitute the following:

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

2.24. Delete Section 4.2.1 and substitute the following:

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

OSE FORM 00201**STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS****2.25. Delete Section 4.2.2 and substitute the following:**

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

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

2.26. Delete Section 4.2.3 and substitute the following:

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

2.27. Insert the following Section 4.2.4:

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

2.28. Delete Section 4.3.1 and substitute the following:

4.3.1 All copies of the Bid, the bid security, if any, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall, unless hand delivered by the Bidder, be addressed to the Owner's designated purchasing office as shown in the Invitation for Bids. The envelope shall be identified with the Project name, the Bidder's name and address and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail or special delivery service (UPS, Federal Express, etc.), the envelope should be labeled "BID ENCLOSED" on the face thereof. Bidders hand delivering their Bids shall deliver Bids to the place of the Bid Opening as shown in the Invitation for Bids. Whether or not Bidders attend the Bid Opening, they shall give their Bids to the Owner's procurement officer or his/her designee as shown in the Invitation for Bids prior to the time of the Bid Opening.

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

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

2.30. Delete Section 4.4.2 and substitute the following:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

6.1 CONTRACTOR'S RESPONSIBILITY

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

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

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

2.37. *Insert the following Section 6.4*

6.4 CLARIFICATION

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

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

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

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

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

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

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

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

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

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

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

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

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

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

9.2 CONTRACTOR LICENSING

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

9.3 SUBMITTING CONFIDENTIAL INFORMATION

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

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

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

9.4 POSTING OF INTENT TO AWARD

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

Room or Area of Posting: Receptionist Area

Building Where Posted: Facilities Center

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.

OSE FORM 00201

STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS

9.8 TAX CREDIT FOR SUBCONTRACTING WITH MINORITY FIRMS

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

§ 9.9 OTHER SPECIAL CONDITIONS OF THE WORK

END OF DOCUMENT

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. Fraternalization between Contractor's employees and USC students, faculty or staff is strictly prohibited - zero tolerance!
3. USC will not tolerate rude, abusive or degrading behavior on the job site. Heckling and cat-calling directed toward students, faculty or staff or any other person on USC property is strictly prohibited. Any contractor whose employees violate this requirement will be assessed a fine of up to \$500 per violation.
4. Contractor's employees must adhere to the University's policy of maintaining a drug-free and smoke-free/tobacco free workplace.
5. Contractor must sign a Contractor Key Receipt/Return form before any keys are issued. Keys must be returned immediately upon the completion of the work. The Contractor will bear the cost of any re-keying necessary due to the loss of or failure to return keys.
6. A welding permit must be issued by the University Fire Marshall before any welding can begin inside a building. Project Manager will coordinate.
7. Contractor must notify the University immediately upon the discovery of suspect 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 Contractors 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.
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 one (1) 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 up to \$1,000.00 daily per violation.
13. Contractor must provide all O&M manuals, as-built drawings, and training of USC personnel on new equipment, controls, etc. prior to Substantial Completion. Final payment will not be made until this is completed.
14. Tree protection fencing is required to protect existing trees and other landscape features to be preserved within a construction area. The limits of this fence will be evaluated for each situation with the consultant, USC Arborist and USC Project Manager. The tree protection fence shall be 6' 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 3" layer of mulch shall be placed over the tree protection area to maintain moisture in the root zone if USC Arborist determines that construction may decrease amount of moisture needed to sustain health of tree(s).
15. Contractor shall water trees and other landscape material as directed by USC Arborist until site is returned to Owner.
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 on a regular basis (as determined by USC Project Manager), a construction entry road consisting of 10' X 16' oak logging mats placed 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 at Contractor's expense before final payment is made.

Contractor Vehicle Requirements on Campus

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 be authorized by USC Grounds Department and USC Project Manager. 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 Afixed@. Parking spaces are restricted to work vehicles only; no personal vehicles.

AIA Document A310 Bid Bond
Replacement Page

Original AIA Documents on file at the
Office of Facilities Business and Finance
743 Greene Street, Columbia, SC 29208

**SE-330 – LUMP SUM BID
BID FORM**

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 USC Salkehatchie Science Building Renovation
PROJECT NUMBER H38-I319

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):* Renovation of a portion (~1900 SF) of the existing Science building. Includes new finishes, modest wall rearrangement, new MEP. The base bid renovation is for classroom space.,

_____, which sum is hereafter called the Base Bid.

(Bidder - insert Base Bid Amount on line above)

**SE-330 – LUMP SUM BID
BID FORM**

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

ALTERNATE # 1 (*Brief Description*): The work included under the alternate is to create 4 new office spaces and a work area within the building envelope.

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*): _____

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)

**SE-330 – LUMP SUM BID
 BID FORM**

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

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

| 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 | | |
| | | |
| | | |
| | | |
| | | |
| ALTERNATE 2 | | |
| | | |
| | | |
| | | |
| | | |
| ALTERNATE 3 | | |
| | | |
| | | |
| | | |
| | | |

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

INSTRUCTIONS FOR SUBCONTRACTOR LISTING

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

**SE-330 – LUMP SUM BID
BID FORM**

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

§ 9. TIME OF CONTRACT PERFORMANCE AND LIQUIDATED DAMAGES

a. **CONTRACT TIME:** Bidder agrees that the Date of Commencement of the Work shall be established in a Notice to Proceed to be issued by the Owner. Bidder agrees to substantially complete the Work within **180** 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 **\$500.00** 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**

BIDDER'S TAXPAYER IDENTIFICATION

FEDERAL EMPLOYER'S IDENTIFICATION NUMBER: _____

OR

SOCIAL SECURITY NUMBER: _____

CONTRACTOR'S CLASSIFICATIONS AND SUBCLASSIFICATIONS WITH LIMITATIONS

Classification(s) & Limits: _____

Subclassification(s) & Limits: _____

SC Contractor's License Number(s): _____

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

SIGNATURE

BIDDER'S LEGAL NAME: _____

ADDRESS: _____

BY: _____
(Signature)

DATE: _____

TITLE: _____

TELEPHONE: _____

EMAIL: _____

AIA Document A101 – 2007 Edition

Replacement Page

Original AIA Documents on file at the
Office of Facilities Business and Finance
743 Greene Street, Columbia, SC 29208

OSE FORM 00501 STANDARD MODIFICATIONS TO AGREEMENT BETWEEN OWNER AND CONTRACTOR

OWNER: University of South Carolina

PROJECT NUMBER: H38-I319

PROJECT NAME: USC Salkehatchie Science Building Renovation

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 3.2 and substitute the following:*

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

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

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

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

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

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

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

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

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: Dwight Cathcart
Title: Project Manager
Address: 743 Greene Street, Columbia, SC 29208
Telephone: 803-777-9824**FAX:** 803-777-8739
Email: dcathcar@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: _____

OSE FORM 00501
STANDARD MODIFICATIONS TO AGREEMENT BETWEEN
OWNER AND CONTRACTOR

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: C. Meredith Drakeford, Jr.
Title: Principal Architect/Owner
Address: 120 North Main Street, Sumter, SC 29150
Telephone: 803-774-2000 **FAX:** 803-774-2003
Email: drakefordarchitects@sc.rr.com

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

Invitation for Construction Bids (SE-310)
Instructions to Bidders (AIA Document A701-1997)
Standard Supplemental Instructions to Bidders (OSE Form 00201)
Contractor's Bid (Completed SE-330)
Notice of Intent to Award (Completed SE-370)
Certificate of procurement authority issued by the SC Budget & Control Board

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

END OF DOCUMENT

AIA Document A201 – 2007 Edition

Replacement Page

Original AIA Documents on file at the
Office of Facilities Business and Finance
743 Greene Street, Columbia, SC 29208

OSE FORM 00811

STANDARD SUPPLEMENTARY CONDITIONS

OWNER: University of South Carolina

PROJECT NUMBER: H38-I319

PROJECT NAME: USC Salkehatchie Science Building Renovation

1 GENERAL CONDITIONS

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

2 STANDARD SUPPLEMENTARY CONDITIONS

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

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

3 MODIFICATIONS TO A201-2007

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

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

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

3.3 *Add the following Section 1.1.9:*

1.1.9 NOTICE TO PROCEED

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

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

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

3.5 *Delete Section 1.5.1 and substitute the following:*

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

OSE FORM 00811**STANDARD SUPPLEMENTARY CONDITIONS**

3.6 *Delete Section 2.1.1 and substitute the following:*

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

3.7 *Delete Section 2.1.2 and substitute the following:*

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

3.8 *Delete Section 2.2.3 and substitute the following:*

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

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

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

3.10 *Delete Section 2.2.5 and substitute the following:*

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

3.11 *Add the following Sections 2.2.6 and 2.2.7:*

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

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

3.12 *Delete Section 2.4 and substitute the following:*

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

OSE FORM 00811**STANDARD SUPPLEMENTARY CONDITIONS**

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

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

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

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

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

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

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

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

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

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

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

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

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

acceptable to the Owner,

3.22 *Delete Section 3.9.2 and substitute the following:*

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

OSE FORM 00811**STANDARD SUPPLEMENTARY CONDITIONS**

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

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

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

3.24 *Delete Section 3.10.3 and substitute the following:*

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

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

3.25 *Add the following Section 3.10.4:*

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

3.26 *Add the following Section 3.12.5.1:*

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

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

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

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

OSE FORM 00811

STANDARD SUPPLEMENTARY CONDITIONS

3.29 Add the following Sections 3.13.2 and 3.13.3:

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

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

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

including loss of use resulting therefrom,

3.31 *Delete Section 4.1.1 and substitute the following:*

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

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

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

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

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

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

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

3.35 *In Section 4.2.5, after the words "evaluations of the" and before the word "Contractor's," insert the following:*

Work completed and correlated with the

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

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

OSE FORM 00811

STANDARD SUPPLEMENTARY CONDITIONS

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

OSE FORM 00811**STANDARD SUPPLEMENTARY CONDITIONS**

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

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

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

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

3.45 *Delete the last sentence of Section 5.4.1.*

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

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

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

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

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

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

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

3.49 *Delete Section 7.2.1 and substitute the following:*

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

- .1** The change in the Work;

OSE FORM 00811**STANDARD SUPPLEMENTARY CONDITIONS**

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

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

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

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

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

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

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

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

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

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

3.52 *Delete Section 7.3.7 and substitute the following:*

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

OSE FORM 00811**STANDARD SUPPLEMENTARY CONDITIONS**

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

3.53 *Delete Section 7.3.8 and substitute the following:*

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

3.54 *Add the following Sections 7.5 and 7.6:*

7.5 AGREED OVERHEAD AND PROFIT RATES

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

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

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

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

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

§ 7.6.3 Records Retention.

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

OSE FORM 00811
STANDARD SUPPLEMENTARY CONDITIONS

3.55 Delete Section 8.2.2 and substitute the following:

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

3.56 Delete Section 8.3.1 and substitute the following:

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

3.57 Insert the following at the end of Section 9.1:

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

3.58 Delete Section 9.2 and substitute the following:

9.2 SCHEDULE OF VALUES

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

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

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

3.59 Delete Section 9.3.1 and substitute the following:

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

OSE FORM 00811
STANDARD SUPPLEMENTARY CONDITIONS

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

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

Insert the following at the end of Section 9.3.2:

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

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

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

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

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

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

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

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

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

3.64 *Delete Section 9.7 and substitute following:*

9.7 FAILURE OF PAYMENT

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

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

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

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

3.67 *Delete Section 9.8.3 and substitute the following:*

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

OSE FORM 00811**STANDARD SUPPLEMENTARY CONDITIONS**

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

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

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

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

3.70 *Delete Section 9.10.1 and substitute the following:*

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

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

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

OSE FORM 00811**STANDARD SUPPLEMENTARY CONDITIONS**

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

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

3.73 Delete Section 9.10.5 and substitute the following:

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

3.74 Add the following Section 9.10.6:

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

3.75 Delete Section 10.3.1 and substitute the following:

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

3.76 Insert the following at the end of Section 10.3.2:

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

3.77 Delete Section 10.3.3 and substitute the following:

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

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

In addition to its obligations under Section 3.18, the

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

OSE FORM 00811
STANDARD SUPPLEMENTARY CONDITIONS

3.80 *Insert the following at the end of Section 10.4:*

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

3.81 *Delete 11.1.2 and substitute the following:*

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

- (1) COMMERCIAL GENERAL LIABILITY:**
 - (a) General Aggregate (per project) \$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

OSE FORM 00811**STANDARD SUPPLEMENTARY CONDITIONS**

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

3.83 *Delete Section 11.1.4 and substitute the following:*

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

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

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

3.85 *Delete the language of Section 11.3.1.2 and substitute the word "Reserved."*

3.86 *Delete the language of Section 11.3.1.3 and substitute the word "Reserved."*

3.87 *Delete Section 11.3.2 and substitute the following:*

11.3.2 BOILER AND MACHINERY INSURANCE

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

3.88 *Delete Section 11.3.3 and substitute the following:*

11.3.3 LOSS OF USE INSURANCE

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

3.89 *Delete Section 11.3.4 and substitute the following:*

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

3.90 *Delete the language of Section 11.3.5 and substitute the word "Reserved."*

3.91 *Delete Section 11.3.6 and substitute the following:*

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

OSE FORM 00811**STANDARD SUPPLEMENTARY CONDITIONS**

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.

OSE FORM 00811**STANDARD SUPPLEMENTARY CONDITIONS**

3.98 *Add the following Sections 11.4.3 and 11.4.4:*

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

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

3.99 *Delete Section 12.1.1 and substitute the following:*

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

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

3.101 *In Section 12.2.2.3, add the following to the end of the sentence:*

unless otherwise provided in the Contract Documents.

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

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

3.103 *Delete Section 13.1 and substitute the following:*

13.1 GOVERNING LAW

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

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

13.2 SUCCESSORS AND ASSIGNS

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

3.105 *Delete Section 13.3 and substitute the following:*

13.3 WRITTEN NOTICE

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

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

OSE FORM 00811**STANDARD SUPPLEMENTARY CONDITIONS**

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

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

Unless expressly provided otherwise,

3.107 *Add the following Section 13.4.3:*

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

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

3.5 Warranty

3.17 Royalties, Patents and Copyrights

3.18 Indemnification

7.6 Cost or Pricing Data

11.1 Contractor's Liability Insurance

11.4 Performance and Payment Bond

15.1.6 Claims for Listed Damages

15.1.7 Waiver of Claims Against the Architect

15.6 Dispute Resolution

15.4 Service of Process

3.108 *Delete Section 13.6 and substitute the following:*

13.6 INTEREST

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

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

3.110 *Add the following Sections 13.8 through 13.16:*

13.8 PROCUREMENT OF MATERIALS BY OWNER

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

13.9 INTERPRETATION OF BUILDING CODES

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

OSE FORM 00811**STANDARD SUPPLEMENTARY CONDITIONS**

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

OSE FORM 00811

STANDARD SUPPLEMENTARY CONDITIONS

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

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

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

3.113 *In Section 14.1.4, replace the word “repeatedly” with the word “persistently.”*

3.114 *Delete Section 14.2.1 and substitute the following:*

14.2.1 The Owner may terminate the Contract if the Contractor

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

3.115 *In Section 14.2.2, delete the parenthetical statement “, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action,” immediately following the word “Owner” in the first line.*

3.116 *In Section 14.2.4, replace the words “Initial Decision Maker” with the word “Architect”*

3.117 *Add the following Section 14.2.5:*

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

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

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

3.119 *Delete Section 14.4.1 and substitute the following:*

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

3.120 *Delete Section 14.4.2 and substitute the following:*

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

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

OSE FORM 00811**STANDARD SUPPLEMENTARY CONDITIONS**

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

3.121 *Delete Section 14.4.3 and substitute the following:*

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

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

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

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

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

14.5 CANCELLATION AFTER AWARD BUT PRIOR TO PERFORMANCE

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

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

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

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

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

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

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

OSE FORM 00811**STANDARD SUPPLEMENTARY CONDITIONS**

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

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

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

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

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

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

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

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

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

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

OSE FORM 00811**STANDARD SUPPLEMENTARY CONDITIONS**

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

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

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

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

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

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

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

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

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

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

15.6 DISPUTE RESOLUTION

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

OSE FORM 00811

STANDARD SUPPLEMENTARY CONDITIONS

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

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

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

15.6.5 SERVICE OF PROCESS

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

3.132 Add the following Article 16:

ARTICLE 16 PROJECT-SPECIFIC REQUIREMENTS AND INFORMATION

16.1. Inspection Requirements: *(Indicate the inspection services required by the Contract)*

- Special Inspections are required and are not part of the Contract Sum. *(see section 01400)*
- Building Inspections are required and are not part of the Contract Sum. *(see section 01400)*
- Building Inspections are required and are part of the Contract Sum. The inspections required for this Work are : *(Indicate which services are required and the provider)*

- Civil: _____
- Structural: _____
- Mechanical: _____
- Plumbing: _____
- Electrical: _____
- Gas: _____
- Other *(list)*: Mechanical 15/Balance Test and Report
Division 5/Steel Connections

Remarks: All work is required to be inspected by the local building inspector.

OSE FORM 00811**STANDARD SUPPLEMENTARY CONDITIONS**

- 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)*
See Division 1, Paragraph 0109 Cash Allowances
- 16.3.** Requirements for Record Drawings, if any. *(Refer to attachments as needed. If none, enter NONE)*
Contractor shall provide blueprint marked in red showing all modifications and as-built conditions reflecting the project entirely.
- 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)*
See Division 1, Paragraph 0111
- 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)*
See Division 1, Paragraph 0111
- 16.6.** Requirements for Project Cleanup in addition to the Contract, if any. *(Refer to attachments as needed. If none, enter NONE)*
See Division 1, Paragraph
- 16.7.** List all attachments that modify these General Conditions. *(If none, enter NONE)*
none

Performance 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

State Project Name: USC Salkehatchie Science Building Renovation
State Project Number: H38-I319
Brief Description of Awarded Work, as found on the SE-330, Bid Form: Renovation of a portion (~1900 SF) of the existing Science building. Includes new finishes, modest wall rearrangement, new MEP.

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

Name: Drakeford Architects
Address: 120 North Main Street
Sumter, SC 29150

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
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: USC Salkehatchie Science Building Renova
Project Number: H38-I319
Brief Description of Awarded Work, as found on the SE-330, Bid Form: Renovation of a portion (~1900 SF) of the existing Science building. Includes new finishes, modest wall rearrangement, new MEP.

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

Name: Drakeford Architects
Address: 120 North Main Street
Sumter, SC 29150

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

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

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

CONTRACTOR

SURETY

By: _____
(Seal)

By: _____
(Seal)

Print Name: _____

Print Name: _____

Print Title: _____

Print Title: _____
(Attach Power of Attorney)

Witness: _____

Witness: _____

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

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

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

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

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

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

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

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

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

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

13. DEFINITIONS

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

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

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

Project Name: USC Salkehatchie Science Building Renovation

Project Number: H38-I319

University of South Carolina

CONTRACTOR'S ONE YEAR GUARANTEE

STATE OF SOUTH CAROLINA

COUNTY OF COLLETON

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 _____

DIVISION 1 GENERAL REQUIREMENTS

0100 CONDITIONS, GENERAL AND MODIFIED

- a. The provisions of the Instructions to Bidders, the General Conditions and the General Requirements of these Specifications shall govern the work under all Divisions or Sections the same as if incorporated therein and are binding on the Contractor and each Subcontractor.

0101 SCOPE OF THE WORK

- a. The contractor shall provide for each Division of these specifications all labor, materials, equipment and supplies, and perform all operations necessary to complete the work in strict accordance with the plans, specifications, General Conditions and the modifications to the General Conditions.
- b.
 - 1) It is the intent of the Owner to renovate and add on to while existing operations occur in the adjacent existing buildings and continue to do business with the public while the new construction is underway.
 - 2) The contractor is required to implement appropriate safeguards to protect the existing school buildings and grounds and the staff, and public users of these buildings during all phases of this project as may be required.
 - 3) All work of this project is to be carried out so that the least interference possible occurs to the normal business operation of USC Salkehatchie.

0102 CONTRACTOR'S RESPONSIBILITY

- a. During the bidding phase of this project and prior to construction of this project, the Contractor shall thoroughly review all drawings and specifications and shall thoroughly investigate all job and site conditions. All work which is manifestly necessary and is reasonably implied to carry out the content and intent of the drawings and specifications, or which is customarily performed for such work shall be performed on this project by the Contractor at no additional cost to the Owner as if fully and completely set forth and described on the drawings and specified herein. Any questions regarding the content or intent of the drawings or specifications shall be brought to the attention of the Architect prior to offering a bid and/or prior to construction first orally and then followed in writing.
- b. All bidders are required to furnish three (3) references to the Owner for review by the Owner regarding workmanship and craftsmanship of past projects.

0103 APPROVAL OF MATERIALS

- a. The names of certain brands and/or manufacturers, where called for in the specifications are to denote and convey the general style, type, character and quality of the article desired.

- b. The substitution for any brand and/or manufacturer specified shall be submitted in writing by the Contractor for approval by the Architect. Permission to substitute materials or manufacturers shall only be available as expressed in writing by the Architect.

0104 ERRORS AND QUESTIONS

- a. Prior to bidding and during the execution of the work the Contractor shall check all drawings, specifications and job conditions; and shall immediately report any errors, discrepancies, conflicts and omissions found therein to the Architect orally, followed by a written statement. Any resulting problems which may exist and are subsequently confirmed by the Architect, shall be resolved by the Architect before proceeding with the work.

0105 MATERIALS, WORKMANSHIP AND CODES

- a. All materials and workmanship under this contract shall comply with or exceed the standards as set forth by E.P.A., DHEC, OSHA, State, City of Walterboro and Colleton County and other authorities having jurisdiction, whose standards take precedence. The building and all elements of the building shall comply with the International Building Code, 2006 Edition and the Americans with Disabilities Act of 2003.
- b. All manufactured equipment and products shall be installed as per manufacturer's latest printed instructions, unless specified otherwise herein.

0106 TEMPORARY FACILITIES

- a. Heat: The Contractor shall provide temporary heat as necessary to protect all work and materials against injury from dampness and cold and to dry out moisture from the building. Fuel, equipment and method of heating shall be satisfactory to the Contractor's insurance company, the Owner and the local building inspector.

Payment for all fuel used during the construction period shall be made by the Contractor.

- b. Telephone: The Contractor shall install a job telephone for the duration of the project. Cost of installing and operating the phone will be borne by the Contractor.
- c. Roadways: The Contractor shall properly maintain a temporary roadway to provide proper access to building. Locate roadway as required by staging conditions and as approved by Architect.

0107 SUMMARY OF CERTIFICATES AND PERMITS TO BE PROVIDED BY THE CONTRACTOR TO THE ARCHITECT.

- a. Before Commencement of Work
 - 1) Building Permit
 - 2) Performance Bond and Payment Bond purchased by the Contractor.
 - 3) Certificate of Contractor's Liability Insurance

USC Salkehatchie Science Building Renovation – Project # H38-I319

4) Certificate of Builder's Risk Insurance

b. At Substantial Completion

- 1) Certificate of Substantial Completion on form provided by Architect.
- 2) Guaranty of termite treatment protection by applicator of treatment, in the name of the Owner, with accompanying Surety Bond.
- 3) Any applicable Guaranties for materials and workmanship as covered elsewhere in the specifications
- 4) Equipment and Appliances Warranties with appropriate instruction manuals.
- 5) Reports resulting from special inspection (See 0112, this section)

- c. At Completion of Work: Acceptance and Final Payment Certificate, on form provided by the Architect, which guarantees payment of all indebtedness connected with the work and a release of all liens connected with the work.

0108 SUMMARY OF CERTIFICATES TO BE PROVIDED BY THE OWNER TO THE ARCHITECT.

a. Before commencement of work:

- 1) Written authorization to proceed

b. At Completion of Work

- 1) Acceptance and Final Payment Certificate on form provided by the Architect.

0109 CASH ALLOWANCES

- a. The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. These allowances shall cover the net cost of the materials and equipment delivered and unloaded at the site; labor, overhead, profit and other expenses contemplated for the original allowance shall be included in the Contract Sum and not in the allowances (unless specified otherwise herein). No additional money shall be paid to the Contractor for the amount of material necessary for routine waste due to seaming patterns normally associated with floor coverings or wall coverings. The Contractor shall cause the work covered by these allowances to be performed for such amounts and by such persons as the Architect may direct, but he will not be required to employ persons against whom he makes a reasonable objection. If the cost, when determined, is more than or less than the allowances, the Contract Sum shall be adjusted accordingly by Change Order which will include additional handling costs on the site, labor, installation costs, overhead profits and other expenses resulting to the Contractor from any increase over the original allowance.

1) Hardware: Allow Five Thousand (\$5,000.00) dollars.

1) Carpet: Allow twenty four (\$24.00) dollars per square yard in this bid for the purchase and delivery of carpet (including such sales and other tax as is applicable).

0111 SPECIAL CONDITIONS

- a. Scaling: Under no conditions will the drawings be scaled to determine dimensions.

- b. Reports: The Contractor shall furnish the Architect before the first payment becomes due, a correct statement showing the cost of each part of the work as sub-divided in the specifications, the total equaling the contract sum.
- c. Payments: Payments will be made to the Contractor in current funds, subject to additions and deductions as provided in these specifications, as follows:
 - 1) On or about the second day of each month, the Contractor thirty (30) shall submit a statement of the amounts that he has paid for materials suitably stored on the site as well as materials placed in permanent position and work performed in connection therewith during the previous thirty (30) days.
 - 2) Upon approval by the Architect, this amount shall be paid to the Contractor, minus ten percent (10%) of sum of such statement, on or before the fifteenth day of the month in which such statement is made, provided that in the judgment of the Architect the sum of all payments at any time shall not exceed an amount that bears that same ratio to the total contract price less the percent as the amount of work performed bears to the whole construction.
 - 3) Final payment shall be due thirty (30) days after the complete fulfillment of the contract.
 - 4) Request for payment shall be made by the Contractor on forms furnished by the Contractor subject to the Architect's approval.
- d. Payments Withheld: The Architect may withhold or, on account of subsequently discovered evidence, nullify the whole or a part of any certificate to such extent as may be necessary to protect the Owner from loss on account of:
 - 1) Defective work not remedied.
 - 2) Claims filed or reasonable evidence indicating probable filing of claims.
 - 3) Failure of the Contractor to make payments properly to subcontractors or for material or labor.
 - 4) A reasonable doubt that the Contract can be completed for the balance then unpaid.
 - 5) Damage to another contractor or to the Owner's property.

When the above grounds are removed, payment will be made for amounts withheld because of them.

- e. Insurance: The General Contractor and each subcontractor shall carry the various types of insurance coverage called for in this section, and the General Contractor shall be responsible for the insurance requirements of the subcontractors. All insurance required herein shall be

placed with financially responsible insurance companies, licensed to do business in the state in which the work is located, and must be approved by the Owner. All insurance required herein shall be in full force and effect until the work is accepted and taken over by the Owner. As evidence of all such insurance as is required herein, the General Contractor shall file with the Architect before work is commenced, certificates of such insurance policies in duplicate signed by a duly authorized agent of the insurance companies with which such insurance is carried.

f. Workmen's Compensation and Employer's Liability Insurance:

- 1) To afford protection under the Workmen's Compensation Law of the state in which the work is performed, and
- 2) Employer's liability protection subject to a minimum of \$100,000.00.

g. Contractor's Bodily Injury and Property Damage Liability Insurance: This insurance shall be Contractor's Public Liability Insurance and Vehicle

Insurance that will be used in any phase of the work required for such insurance as follows:

Comprehensive General Liability Insurance (Written on "Occurrence" basis) in amounts not less than:

| | |
|-----------------|--|
| Personal Injury | \$500,000 each occurrence \$500,000 aggregate |
| Property Damage | \$100,000.00 each occurrence \$100,000.00 aggregate |

Comprehensive Automobile Liability Insurance (including owned, non-owned and hired vehicles) in the following minimum amounts:

| | |
|-----------------|--|
| Bodily Injury | \$500,000 single limit |
| Property Damage | \$35,000.00 Uninsured motorist single limit \$500,000.00 single limit |

- h. Builders Risk Insurance: Contractor shall provide insurance sufficient to provide 100% coverage for project for all labor and material in whole until Substantial Completion and Occupancy by Owner.
- i. Substitutions/Changes: No changes shall be made in either the plans or specifications without written approval of the Architect and the Owner.
- j. Shop Drawings: The Contractor shall furnish complete shop drawings (three sets minimum, except four sets minimum where indicated for steel reinforcement and steel members) for all shop fabricated portions of the work as may be necessary for the proper understanding of the methods of construction, details of design and procedure for installations. The Contractor shall examine and ascertain that shop drawings have been made in conformity with the Contract Documents, job conditions and dimensions and shall stamp his approval on the shop drawings,

so indicating their conformance, before submitting them to the Architect for review and approval.

The Contractor shall examine and check all dimensions and conditions of structure and layouts of mechanical trades and shall so arrange his work that it will be completely coordinated with the structure and these trades. The Contractor will be solely responsible for compliance with Building Code requirements, all dimensions, and all conditions relating to his work under this Contract. The Architect will check shop drawings only for conformance with the design concept of the project and with the information given in the Contract Documents.

k. Temporary Facilities:

- 1) Signs: The Contractor shall furnish and install a job sign naming the Project, Owner, Architect and General Contractor. No other signs will be permitted unless approved by the Architect. The sign shall be installed on the site where instructed by the Architect. See drawings for sign design.
- 2) Storage Facilities: The Contractor shall provide a suitable temporary building for storing tools, equipment and materials. This building shall be installed at the commencement of work and shall be removed when the job is completed.
- 3) Latrines: The Contractor shall provide and maintain during the construction, adequate latrines for workmen acceptable to the Owner and to health authorities. Plumbing fixtures in the adjacent or existing building shall not be used by the workmen.

l. Temporary Utilities:

- 1) Water for construction purposes must be obtained by the contractor at the Contractor's expense.
- 2) All temporary arrangements required for electrical power service will be the Contractor's responsibility and it shall be the Contractor's responsibility to accomplish this work in accordance with the National Electric Code, the International Building Code and as approved by the local utilities company, and city and county codes enforcement officer.
- 3) Contractor will pay the cost of consumption of all temporary utilities during construction.

m. Trespassers: The Contractor is to keep trespassers away from the building and outside of the storage limits. No one is to be allowed within the limits of the building site except on business directly connected with the building, unless written permission is given by the Owner. He is to enforce this portion of the Contract as long as he is in charge of the building. A temporary fence shall be installed by the contractor as necessary to enforce this requirement. The design and construction of the fence shall be approved by the Architect.

n. Interference: The construction work must be carried on in such a manner as to cause the least amount of interference and inconvenience to the adjacent property owners.

- o. Time Limit and Liquidated Damages: It is hereby understood and agreed by the parties hereto that time is of the essence of this Contract and that great energy and diligence shall characterize all operations carried on under this agreement. The preparation of any work away from the building shall be done at the earliest possible time, and every precaution shall be taken in advance to avoid delays. The Contractor shall keep constantly employed at the building sufficient number of workmen with sufficient materials to satisfy the Owner that the work is being conducted with the utmost rapidity consistent with proper workmanship.

Actual physical work on site with an adequate force and equipment shall begin within seven (7) days from the date of "Notice to Proceed". All work under this contract shall be substantially completed in one hundred and eighty (180) consecutive days from the date of "Notice to Proceed". Should the contractor fail to complete this Contract within the time specified previously, or at a later date as authorized in writing by the Owner, he shall pay to the Owner liquidated damages in the amount of five hundred (\$500.00) Dollars per day. Final completion shall be obtained within thirty days of Substantial Completion.

- p. Occupancy, Completion and Acceptance:

- 1) It is understood that as soon as the building is substantially complete, it may be turned over to the Owner for occupancy and use even though the Contract as a whole may not be entirely complete and the building may not be complete in final form.
- 2) Substantial completion is defined as completion of the work to a degree that the building may be fully occupied and utilized for the purpose for which it was designed, without hazard or inconvenience to the occupants, with only minor details that do not adversely affect the usefulness of the structure as the drawings indicative remaining incomplete. The following items shall be provided to the Architect prior to partial Substantial Completion or Substantial Completion:

- 1) All Manuals and Warrantees.
- 2) Satisfactory potable water report.
- 3) HVAC Test and air balance report.
- 4) Satisfactory test and report that fire alarm, smoke detector system is operational and tied to 24 hour monitoring system.
- 5) Electrical system tested and installed as per designed.
- 6) Satisfactory test and report from Structural and MEP inspectors.
- 7) All Special Inspection Reports and Documents
- 8) Acceptance from local fire officials, and
- 9) No life safety punch list items.

Final completion is defined as total completion of all details and requirements of the full contract to the satisfaction of the Owner, at which time the building will be fully accepted and the Contractor released of all responsibility under the Contract, except guarantees and conditions that are applicable after final completion and acceptance. All work (Final Completion) shall be completed within FORTY FIVE (45) days of Substantial Completion.

- q. Maintenance: The Contractor shall keep his entire portion of the work in repair without expense to the Owner as far as concerns defects of workmanship or materials, for a period of one year from the date of the final written acceptance by the Owner, (unless specified for a longer time

elsewhere) and shall be responsible for, and make good any damage to his work caused by such defect; but this clause shall not be interpreted as holding him responsible for making good any deterioration of his part of the work due to its use or abuse by the Owner.

- r. **Cleaning Up:** The General Contractor shall keep the entire building clean and free from an accumulation of debris or building materials during the construction. At the completion of the work, the entire building and premises shall be left clean. The General Contractor shall remove from the premises all accumulations of trash and other materials which are not to be used in the construction.
- s. **Progress Schedule:** Upon the award of contracts for this project, a combined tentative Progress Schedule covering all work will be prepared by the several subcontractors under the coordination and under the direction of the General Contractor. The Progress Schedule will be submitted to the Architect for approval by the General Contractor and after the submittal of the tentative schedule, a final Progress Schedule similarly prepared, shall be submitted to the Architect.
- t. **Substantial Completion** is the date from which all warranties and guarantees begin, the date that stops the timing and consideration of liquidated damages, and the date that the building insurance is assumed by the Owner.

0112 Inspections Required by Code

- a. IBC Chapter 1 Inspections shall be performed according to 2003 IBC, Section 109. Inspection services shall be provided by the Owner. It shall be the responsibility of the contractor to request and schedule required inspections and to adjust the project schedule prior to starting construction in order to fully accommodate these inspections.
- b. IBC Chapter 1 Inspections will include the following:
 - 1) Footing or foundation inspection (IBC 103.3.1)
 - 2) Concrete slab or under-footing inspection (IBC 109.3.2)
 - 3) Lowest Floor elevation (IBC 109.3.3)
 - 4) Frame Inspections (IBC 109.3.4)
 - 5) Lath or gypsum board inspection (IBC 199.3.5)
 - 6) Fire-resistant penetrations (IBC 109.3.6)
 - 7) Energy efficiency (IBC 109.3.7)
 - 8) Building Envelope Compliance
 - 9) HVAC Compliance
 - 10) Service Water Heating Compliance
 - 11) Lighting Compliance
 - 12) Special inspection and test requirements (IBC 909.3)
 - 13) Inspection of fill. (S406.6.6)
 - 14) Foundation Inspection (RR109.1.1)
 - 15) Plumbing, Mechanical, gas and electrical system inspections.
- c. **Inspection Reports:** Contractor shall maintain record copies of inspections on site and shall remain available for review by the Architect upon request.

END OF DIVISION ONE

USC Salkehatchie Science Building Renovation – Project # H38-I319

DIVISION 2 SITE WORK

0200 GENERAL

- a. The provisions of the Instructions to Bidders, the General Conditions and the General Requirements of these Specifications shall govern the work under all Divisions or Sections the same as if incorporated therein and are binding on the Contractor and each Subcontractor.

0201 SITE INVESTIGATION:

Prior to Bidding and prior to construction, inspect the site and the adjacent features and all available information concerning conditions of the site for conformance with the Contract Documents. Any errors, inconsistencies, omissions or doubt as to meaning shall be reported to the Architect before the proposed bid is offered to the Owner and before any work proceeds. No additional compensation shall be paid to the Contractor for work required by existing site conditions that were obvious at the time of the bidding.

0202 SCOPE

- a. The Contractor is responsible for the site work for the USC Salkehatchie East Campus Science Building as required to implement and construct the work and requirements as specified herein and as called for on the drawings.
- b. The Contractor is hereby made aware that neighboring businesses and public activities and on-going business will be performed nearby or in the immediate vicinity of the work described herein and shown on the drawings for this project. It shall be the Contractor's responsibility to coordinate the work under this contract with all other work being performed on the site and in the neighboring buildings and to take whatever appropriate measures are required to safeguard personnel and property and to implement his portion of the work under these conditions. If as a result of work performed under this contract the Owner's property or new construction is damaged, it shall be the contractor's responsibility to fully repair and/or replace the damaged work as required to provide a complete remedy at no additional cost to the Owner.

0203 DEMOLITION

- a. The Contractor shall remove any site and building elements as indicated on drawings and as specified herein as required to install or to fully accommodate the new construction. The Contractor shall be fully responsible for protection of life and property during the demolition process. He shall use methods of removal which properly safeguard existing facilities and the neighboring existing buildings and the health and lives of the people involved in the project or near the project and the adjacent properties. Any problems

which might develop shall be brought immediately to the attention of the Architect and resolved before work proceeds any further.

- b. The Contractor shall be responsible for disposing of all demolished material in a legal manner. Burning is not permitted on this project as a means of disposal.
- c. Where existing work is to be altered or removed, or where new work adjoins, connects to or abuts existing work, the existing work shall be altered as required and the new work shall be connected in an appropriate and workmanlike manner. All such new work shall match, member and align with existing adjoining and/or adjacent work. This work shall be conducted in manner that does not damage unaffected adjacent work. All existing work damaged by such operations shall be repaired and/or replaced by the contractor at no additional cost to the owner.

0210 CLEARING OF SITE

- a. The Contractor is responsible for clearing the site as indicated in Scope (Sec. 0202) and as shown on the drawings.
- b. Where clearing is required, clear the site of all existing site elements to be removed and other debris. If stumps and roots larger than two inches (2") in diameter are encountered, they shall be completely removed. The area of operation then shall be cleared of resulting debris and matted roots, weeds and other extraneous matter and such shall be stockpiled where directed by the Owner on site for removal by the Contractor.
- c. All work required on existing utility lines within the site including but not limited to gas, electrical, water, sanitary, sewer and storm sewer, which are to be disturbed, removed and/or relocated shall be done by the Contractor. The Contractor will coordinate with the appropriate utility agency as may be required. All work on utilities shall be performed as required by Public Safety in accordance with the International Building Code as required by Colleton County and as required by the appropriate utility company.
- d. Protect existing trees and other vegetation indicated to remain in place against unnecessary cutting, breaking or skinning of roots, skinning or bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line.

0211 LAYOUT:

The Contractor will be held responsible for the correctness of the layout. Before beginning work, the Contractor shall thoroughly review the dimensions indicated on the drawings for accuracy. Any questions or concerns shall be resolved with the Architect before work proceeds. He shall accurately locate and stake out all buildings and other elements of construction and establish reference points as necessary for related work by other trades. After staking the building, the

location and alignment of building and facilities shall be approved by Architect before proceeding with any other work.

0223 EXCAVATION

- a. General: Excavation shall be carried out in a neat, workmanlike manner, and all excavation shall be properly shored where necessary to prevent caving or slides. The Contractor shall be entirely responsible for damages to property, material, etc., or personnel that may be caused by caving or slides. Refer to Section 0220 "Earthwork" for excavation in the building area. Excavation for footings shall be handtrimmed to exact grades. Any trenches or excavations for footings or slabs carried to grades deeper than required shall be backfilled with concrete at the Contractor's expense.
- b. Excavation for Footings: Contractor shall excavate all footings and foundations down to undisturbed earth or otherwise compacted earth. The bottoms shall be level and the side may be placed against soil if not exposed to view. Steps in footings shall be vertical with reinforcing bent through these steps. Excavations for footings shall be acceptable to the Architect. In no case will footing be poured until the foundation it will rest upon and the required reinforcing steel in place first be approved by the Architect or Owner's representative.
- c. Excavations for Floors and Pavements: Excavation for floors and pavements that rest on grade shall be appropriately graded to result in the final elevations shown on drawings. Floors and pavements in excavated areas shall rest on firm, solid earth acceptable to the Architect. Any loose or unsuitable materials shall be removed and replaced with suitable materials as specified under "Fills".
- d. Pumping: Excavations shall be maintained free of water by pumping or other suitable means, approved by the Architect, during concreting operations and at all times when necessary for proper execution of the work.
- e. Disposal of Excess Earth: Earth resulting from excavations may be used in filling or backfilling only if written approval by Architect is obtained. If unsuitable or not required for this purpose, it shall be disposed of off site by the Contractor at no additional cost to the Owner.

0225 FILLS UNDER FLOORS AND CONCRETE PAVEMENTS

- a. The Contractor shall prepare fills as required and shown on drawings for all floors and pavements resting on grade after they have been inspected and approved by the Architect. These fills shall be placed in even layers of not more than six inches each and each layer shall be thoroughly compacted by means of a mechanical tamping device, and shall meet specifications - this Division.

- b. Materials: Soil making up each layer mentioned shall be of a quality approved by the Architect and shall be entirely free of vegetable humus and other deleterious materials. When the moisture content is too high for proper compaction, excess moisture must be allowed to evaporate before compaction, and if too low, water must be added to obtain 100% ASTM D698 compaction.
- c. Compaction: The soil beneath each layer shall be stable enough to support, without displacement, the tamping specified for each succeeding layer. The compaction of each layer shall begin at the bottom and continue to within approximately one inch of the top of the layer. Each layer shall be so compacted that the method of compacting will depress not more than one inch into the surface of the layer. Compact to 100% ASTM D698.

END OF DIVISION TWO

DIVISION 3 CONCRETE

0300 GENERAL

- a. The provisions of the Instructions to Bidders, the General Conditions and the General Requirements of these Specifications shall govern the work under all Divisions or Sections the same as if incorporated therein and are binding on the Contractor and each Subcontractor.
- b. All workmanship, materials and practices of concrete design and construction not specifically covered herein shall be governed by the standards of the American Concrete Institute and the Portland Cement Association.
- c. Cooperate with other trades regarding installation of embedded items and install anchors, bolts, ties, etc., as required.

0302 STORAGE OF MATERIALS

- a. Store cement off ground on platforms and protect from the elements.
- b. Provide cover for reinforcement prior to use. Remove any rust or scale from reinforcement before placing.

0310 CONCRETE FORMWORK

- a. Construct forms to slope lines and dimensions shown, plumb and straight and sufficiently tight to prevent leakage.
- b. Securely brace and shore forms to prevent displacement and to safely support construction loads.
- c. Keep forms wet as necessary to prevent shrinkage.

0320 CONCRETE REINFORCEMENT

- a. Reinforcing Steel: New billet steel, conforming to ASTM A615, Grade 60.
- b. Steel fabric reinforcing: ASTM A185, 6"x6" mesh, No. 10 gauge steel wire spotwelded at intersections. Use at all slabs (interior and exterior) unless otherwise noted.
- c. Support all reinforcing at proper distances from face of concrete; no wood supports will be allowed. Wire mesh shall be lapped at least twelve (12") inches.

- d. The contractor shall furnish complete shop drawings (four sets) for all reinforcing steel. See Division 1, Section 0110, 1., for other general shop drawing requirements.

0321 EXPANSION JOINTS

- a. Premolded 1/2" thick asphalt-saturated coarse fiber, as manufactured by Celotex Corporation, J&P Petroleum Products, or approved equal.
- b. Keyed joint form pre-formed construction joint by Burke, Greenstreach Plastic, J&P Petroleum Products or Vulcan, or approved equal.
- c. Concrete shall be installed so that no pour exceeds 1600 square feet with no side of a pour exceeding 40 feet in length and as otherwise indicated on the drawings. The Contractor shall submit a proposed pouring sequence to the Architect for approval and location and layout of joints shall be approved by Architect prior to pouring concrete.

0322 VAPOR BARRIER:

Under all building slabs on grade - .006 polyethylene membrane, Visqueen, Sto-cote Products, or Rex Plastics or approved equal. Lap joints 8" minimum.

0325 FIBER MESH REINFORCING:

Where shown on the drawings provide fiber mesh reinforcing 1.5 pounds per cubic yard. Fiber mesh shall be "Hi-Tech Commercial Fibers" by Martin Color-Fi or approved equal. Add to redi-mix concrete as per manufacturer's instructions.

0330 CONCRETE

Concrete shall be furnished by a ready mix plant. No water shall be added in the field either for placing or finishing. Slump shall be no more than 4 inches. All concrete shall obtain a minimum compressive strength of 3,000 PSI at 28 days.

0335 PLACING CONCRETE

- a. Place no concrete until all anchors, bolts, ties, reinforcing, pipes, conduits and vapor barriers have been placed and inspected by Architect.
- b. Before placing concrete, set continuous expansion joint strips where indicated or otherwise where concrete edge of slab abuts a vertical surface; seal joints tightly around pipes penetrating floors using asphalt mastic.

- c. Concrete shall be placed only when temperature is 40 degrees F and rising or above.
- d. Concrete shall be deposited as nearly as practicable in its final position to avoid segregation due to rehandling or flowing. Concrete shall not be subjected to any procedure which will cause segregation. Concrete shall not be dropped any more than 60 inches in forms where reinforcing, spacers, tie rods, etc. would cause segregation or would cause a coating with mortar which will dry on upper levels prior to completion, unless a flexible drop chute or other approved means is used. Concrete shall not be dropped on to exposed earth from a distance of more than 3 feet unless approved by the Architect. Concrete shall be in its final position within 90 minutes after its ingredients are mixed together. No concrete addition shall be used without written permission from the Architect.
- e. Pitch of slabs: On exterior horizontal surfaces, slabs with floor drains, or where indicated on drawings, a slope shall be provided to remove water. If the slope is not indicated, the slab shall be finished with a slope of 1" per 12' so that water will not puddle.

0336 PROTECTION AND CURING:

Protect concrete against frost, temperatures below forty degrees, and rapid drying and keep moist for at least seven (7) days after placing.

0337 FINISHING:

Finish concrete in accordance with current ACI and PCA Standards of Practice.

0370 CONCRETE FINISHES

- a. Exterior walks, slabs and ramps: All exterior concrete slabs shall have a brush finish of a texture approved by the Architect.
- b. Interior slabs: All interior floor slabs shall have a steel trowel finish, troweled with no addition of dry cement nor of dry cement and sand. Troweling shall be delayed until concrete has stiffened to a degree that no free water is drawn to the slab top by troweling.
- c. Where concrete staining is called for on the Finish Schedule, stain colors will be selected from manufacturer's standard selections.

END OF DIVISION THREE

DIVISION 4 MASONRY

0400 GENERAL

- a. The provisions of the Instructions to Bidders, the General Conditions and the General Requirements of these Specifications shall govern the work under all Divisions or Sections the same as if incorporated therein and are binding on the Contractor and each Subcontractor.
- b. All materials, principals and practice of concrete masonry design and construction, such as control joints, bond beams, joint reinforcement, intersecting walls, etc., not specifically covered herein or on the drawings, shall be governed by the standards as set forth by the Portland Cement Association and the National Concrete Masonry Association.
- c. Cooperate with other trades regarding installation of embedded items and install anchors, bolts, ties, etc., as required.

0401 PROTECTION OF MATERIALS

- a. Protect all materials in storage and in place from damage.
- b. Keep all walls dry by covering at end of days work.
- c. Lay no masonry unless outside temperature is 40 degrees F and rising.

0402 CLEANING AND POINTING MASONRY

- a. Pursue work in as clean a manner as possible. Remove excess materials and mortar droppings daily. Remove mortar droppings on adjacent work before its final set.
- b. Upon completion of all masonry, the work shall be thoroughly roughly cleaned using stiff fiber brushes and a cleaning solution as recommended by manufacturer of the masonry units.
- c. The contractor and subcontractor shall follow the recommendations of the Portland Cement Association and the National Concrete Masonry Association concerning the avoidance of efflorescence and the cleaning of efflorescence of masonry.

0403 LAYING MASONRY

- a. All brick and block shall be laid plumb, level and true to line in full mortar so as to fill all joints, both horizontal and vertical, completely full of mortar. Joints shall be uniform, matching joint width of adjacent existing joints where installed in existing construction, and

shall match and member with existing coursing where required. Type or joint shall be selected by the Architect.

- b. Brick coursing shall be established as approved by Architect. Joints shall be uniform, approximately 3/8" wide. Three vertical brick courses and three joints shall equal approximately eight (8") inches. One vertical block course and one block joint shall equal eight (8") inches.
- c. Lay all walls and piers in running bond unless indicated otherwise on drawings. Edges of all brick and blocks shall be straight and true, free and clear from chips and cracks.
- d. Lay out brick work and block work so that no piece shorter than 4" will occur. All cutting shall be done with a masonry saw.

0410 CONCEALED BASE FLASHING AND BASE FLASHING ACCESSORIES

- a. Composite Flexible Base Flashing: Self-sealing, self-healing, fully adhering, composite flexible flashing consisting of 32 mil thick pliable and highly adhesive rubberized asphalt compound bonded completely and integrally to 8 mil thick, high-density, four plies of cross-laminated polyethylene film to produce an overall 40 mil thickness in rolls 75 feet long; protected from contamination from dust or dirt by a silicone-coated release sheet, to be removed immediately before installation.
- b. Surface Conditioner for Composite Flexible Base Flashing: Latex-based, water dispersible liquid for substrate preparation.
- c. Termination Mastic for Composite Flexible Base Flashing: Rubberized asphalt-based mastic for use in sealing membrane terminations.

0412 REINFORCEMENT

- a. Brick and block walls (horizontal): Galvanized steel masonry wall reinforcement installed on vertical center as called for on the drawings. Use truss design by "Duro-wall" or approved equal. Size and install according to manufacturer's recommendations and as called for on the drawings.
- b. Wall ties: Where brick veneer is called for on the drawings, use galvanized wall ties at 16" o.c. horizontal and 16" o.c. vertically. Alternate centers at every other vertical course.
- c. See lintel block and other reinforcement requirements on the drawings.

0413 MORTAR

- a. Above ground: Type "S" mortar by Santee, Giant or Magnolia.
- b. Below grade and in contact with earth: Type "M" mortar by Santee, Giant or Magnolia.
- c. Mortar Color: Above ground use colored mortar (color as selected by Architect) as manufactured by Metromont Materials Corporation or approved equal.

0421 BRICK MASONRY

- a. Facebrick:
 - 1) Use new facebrick where called for on drawings.
 - 2) Allow two hundred eighty five (\$285.00) dollars per thousand for the purchase and delivery of face brick.
- b. Concrete Brick: Where hidden from view or used as back- up, the Contractor may use concrete brick.

0422 CONCRETE MASONRY UNITS:

- a. Concrete block: ASTM C-90, Grade A, Standard Weight Concrete Block. Each block shall attain a minimum strength of 1000 p.s.i. in 7 days.
- b. Install units as recommended by manufacturer and as approved by the Architect.
- c. Grouting of concrete masonry units shall meet the requirements of "Placing Concrete", Division 3, paragraph 0335.
- d. The contractor shall construct an approximately 4' x 4' sample panel using the different colors, shapes and offsets for approval by the Architect prior to the installation of the masonry. Sample Panel shall not be removed until all masonry work is installed and upon approval of the Architect.

0423 MASONRY LINTEL SCHEDULE

- a. Use masonry lintels as required by code and structural conditions.
- b. Steel angles: Unless shown otherwise on drawings, use masonry angle lintels as called for below.

Spans up to

| | | | | | | |
|---------------------|---|--------|---|--------|---|-------|
| 5'-0"..... | L | 3-1/2" | x | 3-1/2" | x | 5/16" |
| 5'-0" to 7'-0"..... | L | 4" | x | 3-1/2" | x | 5/16" |
| 7'-0" to 8'-0"..... | L | 5" | x | 3-1/2" | x | 5/16" |
| 8'-0" to 9'-0"..... | L | 5" | x | 3-1/2" | x | 3/8" |

c. NOTES:

- 1) Place long leg of angles vertically
- 2) One angle required for each 4" of wall thickness. Minimum bearing 6" each side.
- 3) Interior and Exterior angles in 8" walls and interior angles in 12" walls shall be bolted together when clear span of opening is over 6'-0".
- 4) Lintels are designed to carry brick or lighter wall construction only and are not designed to carry any floor or roof load. (See structural drawings also)

END OF DIVISION FOUR

DIVISION 5 METALS

0500 GENERAL

- a. The provisions of the Instructions to Bidders, the General Conditions and the General Requirements of these Specifications shall govern the work under all Divisions or Sections the same as if incorporated therein and are binding on the Contractor and each Subcontractor.
- b. Scope
 - 1) The Contractor shall furnish and install all columns, trusses, frames, girders, beams, angles, lintels, joists, bearing plates, anchor bolts, channels, structural steel, and other metal items as shown on or required by the drawings and as herein specified or reasonably implied.
 - 2) The "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings" of the American Institute of Steel Construction shall be considered as a part of this specification.

0501 MATERIALS

- a. Steel: ASTM A-36; Tubes: ASTM A500; steel joists: steel joist institute.
- b. Arc Welding Electrodes: American Welding Society" Iron and Steel Arc-Welding Electrodes: E70 Series", suitable for intended use.
- c. High Strength Bolts: A325 bolts with threading excluded from the shear planes, unless otherwise noted on drawings.
- d. Machine Bolts: ASTM Specifications for Structural Steel for Bridges and Buildings.

0502 CONNECTIONS

- a. Shop: Welded
- b. Field: 3/4" high strength bolts, unless otherwise noted.
- c. All connections shall develop the full strength of the member and/or the loads /shown on the drawings.
- d. Connections shall be detailed according to a, b, and c above, unless otherwise shown and detailed on the drawings.
- e. No connection shall have less than two bolts.

- f. Single angle connections are to be avoided. No single angle connection will be used without the written consent of the Architect.
- g. High strength bolts to be furnished and installed in accordance with the specifications for structural joints using ASTM A325 bolts approved by Research Council of Riveted and Bolted Structural Joints of the Engineering Foundation and endorsed by AISC Industrial Fasteners Institute.

0503 WORKMANSHIP

- a. Workmanship - AISC Specifications "The Design, Fabrication and Erection of Structural Steel for Buildings".
- b. Mill bearing surfaces to true planes. Fit abutting surfaces closely.
- c. Bring assembled parts into close contact; use drift pins only for bringing members into position, not to enlarge or distort holes.
- d. Execute all welding in shop and field by operators who have been qualified previously by tests in accordance with the American Welding Society "Standard Qualification Procedures" to perform the type of work required. All welding shall be in accordance with the standard specifications for the American Welding Society.
- e. Cooperation: The Contractor shall cooperate with other contractors whose work is in any manner related to his and execute his work in such a manner that the work of other contractors will not be delayed.
- f. Provide round threaded studs or holes for round bolts at 24" on center for wood blocking or as shown on Architect's drawings. Size threaded studs or holes as indicated on the drawings.
- g. Return all welds at corners twice the nominal size of weld minimum.
- h. Butt welds shall be made against a 1"x 1/8" plate. Butt welds shall be of thickness and length equivalent to the parts to be joined. The backup plate shall be slightly longer than the length to be welded so that it is used for starting and ending weld to give full area of weld at edges of beam flanges.
- i. Dissimilar metals - Where dissimilar metals come in contact with each other, paint each surface with heavy coat of asphalt paint or otherwise insulate from each other to prevent galvanic action.

0504 SHOP DRAWINGS:

Four (4) sets Shop Drawings comparable to those in AISC "Structural Steel Detailing" shall be prepared by fabricator and submitted to Architect for review in accordance with General Conditions.

0505 ERECTION

- a. AISC Specification, "The Design, Fabrication and Erection of Structural Steel for Buildings".
- b. Field Connections: High Strength bolts, unless otherwise noted.
- c. Cutting and Fitting: Approval of engineer or authorized representative required.
- d. Holes, Cutting, etc., for Other Trades: Where indicated on the drawings or approved by the engineer for installation of work of other trades.
- e. Cooperation: The Contractor shall cooperate with other contractors whose work is in any manner related to his and execute his work in such a manner that the work of other contractors will not be delayed.
- f. Provide erection bolts as required for welded connection. Erection bolts shall be removed and holes plug-welded.
- g. Bracing: Provide bracing members as shown on drawings. Where practical, all bracing connections shall be designed and detailed so that all force components can be delivered directly to intersecting members. Where this is not possible, connections shall be designed to account for resulting eccentricities.

0506 ANCHOR BOLTS AND COLUMN BASE SETTINGS:

Where exposed to view and/or weather, all anchor bolts shall be hot double-dipped galvanized. Column footings and anchor bolts shall be set accurately to line and grade in accordance with general plans and anchor bolt setting plan and shall not deviate from their theoretical center line in excess of following tolerances: 1/4" for bolts up to two inches in diameter; 1/2" for bolts greater than two inches in diameter. Column base plates shall be thoroughly grouted to elevation shown on plans. Grout shall consist of Embecco grout or approved equal.

0510 QUALITY CONTROL

- a. Contractor will engage independent testing and inspection agency to inspect high-strength bolted connections and welded connections and to perform tests and prepare test reports.

- b. Testing agency shall conduct and interpret tests, state in each report whether test specimens comply with requirements, and specifically state any deviations therefrom.
- c. All bolts to be tested to achieve 380 lbs. of torque. Testing agency to inspect approximately 25% of all erection bolts and welds. If significant non-compliance is discovered, 100% of all connections will be tested until such remedial action has occurred for full compliance. No additional cost to the Owner will be incurred for performance of such work.

0530 METAL STUDS AND JOISTS

- a. All studs and/or joists and accessories shall be of the type, size, gauge and spacing shown on the drawings, and shall be manufactured by United States Gypsum Company or approved equal. Submit product data and shop drawings to Architect.
- b. All structural members shall be designed in accordance with American Iron and Steel institute (AISI) "Specification For the Design of Cold-Formed Steel Structural Members," latest edition w/1989 addendum.
- c. All framing members shall be formed from corrosion- resistant steel, corresponding to the requirements of ASTM A446, with minimum yield strength of 50 ksi for SJ studs, 50 ksi for CR-runners.
- d. Fabrication:
 - 1) Prior to fabrication of framing, the contractor shall submit fabrication and erection drawings to the Architect to obtain approval.
 - 2) All framing components shall be cut squarely for attachment to perpendicular members, or, as required, for an angular fit against abutting members.
 - 3) Axially loaded studs shall be installed in a manner which will assure that their ends are positioned against the inside of runner web prior to fastening.
 - 4) Insulation equal to that specified elsewhere shall be provided in all doubled jamb studs and doubled headers not accessible to insulation contractors.
 - 5) Fastening of components shall be with self-drilling screws or welding. Screws shall be of sufficient size to insure the strength of the connection. Wire tying of components shall not be permitted. All welds shall be touched up with a zinc-rich paint.
- e. Erection (axial load-bearing):

- 1) Runners shall be securely anchored to the supporting structure as shown on the drawings.
 - 2) Complete, uniform and level bearing support shall be provided for the bottom runner.
 - 3) Abutting lengths of runner shall each be securely anchored to a common structural element, butt-welded or spliced.
 - 4) Studs shall be plumbed, aligned and securely attached to flanges of both upper and lower runners.
 - 5) Framing of wall openings shall include headers and supporting studs as shown on the drawings.
 - 6) Temporary bracing, where required, shall be provided until erection is completed.
 - 7) Splices in studs shall not be permitted.
- f. Erection (joists):
- 1) Uniform and level joist bearing shall be provided at walls by means of shims and/or non-settling grout.
 - 2) Joists shall be located directly over bearing studs or a load distribution member shall be provided at the top of the bearing wall.
 - 3) Web stiffeners shall be provided at reaction points and/or at points of concentrated loads where indicated on the drawings.
 - 4) Joist bridging shall be provided where indicated on the drawings.
 - 5) Additional joists shall be provided under parallel partitions when the partition length exceeds one-half the joist span, also around all floor and roof openings which interrupt one or more spanning members, unless otherwise noted.

END OF DIVISION FIVE

DIVISION 6 CARPENTRY

0600 GENERAL

- a. The provisions of the Instructions to Bidders, the General Conditions and the General Requirements of these Specifications shall govern the work under all Divisions or Sections the same as if incorporated therein and are binding on the Contractor and each Subcontractor.
- b. Lumber must be sound, thoroughly seasoned, well manufactured and free from warp. All lumber shall comply with the American Lumber Standards using only the recognized official marks of the Association under whose rules it is graded.
- c. Moisture content shall not exceed neither 19 percent (19%) for framing lumber nor 15 percent (15%) for millwork and finish lumber.
- d. Wood framing occurs in this project only in miscellaneous applications for blocking, bridging, anchoring, etc. where required.

0610 ROUGH CARPENTRY

- a. SEE SECTION 0650 FOR MATERIAL SCHEDULE.
- b. Where required by job conditions, provide all sills, joists, studs, bracing, furring, blocking and rough hardware, such as nails, bolts, anchors, as needed for a complete installation. Concealed blocking to include, but is not limited to, that which is required to overhead cabinets, grab bars, baby changing stations, urinal screens and toilet room equipment.
- c. Wood framing shall be cut square on bearings, closely filled, accurately set to required lines and levels and rigidly secured in place.
- d. Where wood structural members, wood blocking and anchoring elements are used to anchor items used by disabled persons, all such elements shall meet the minimum requirements for structural strength of the Americans with Disabilities Act of 1991.
- e. Frame headers and trimmers for passage of pipes, ducts and other openings in walls and ceilings. Headers and trimmers shall be as a minimum doubled throughout.
- f. Interior stud walls shall be doubled at all openings, boxed to receive wall finish material at partition intersections, and built up solid at exterior corners. Top plates doubled throughout. Studs shall have a minimum of two rows of horizontal blocking for gypsum wall board on all interior stud walls.
- g. Provide headers as follows, unless otherwise indicated on drawings:

| | |
|--------------------|-------------|
| Spans up to 3'-6" | 2-2" x 6"s |
| Spans up to 6'-0" | 2-2" x 8"s |
| Spans up to 10'-0" | 2-2" x 10"s |
| Spans up to 12'-6" | 2-2" x 12"s |

- h. Sole plates for all interior stud walls shall be treated and shall be mechanically anchored (using a nailing gun) when they occur on concrete slab.

0620 FINISH CARPENTRY

- a. SEE SECTION 0660 FOR MATERIAL SCHEDULE
- b. All millwork and trim shall be thoroughly sanded and finished smooth and free from machine or tool marks that will show through the finish. All nail heads shall be set to receive putty.
- c. Provide blocking and lookouts as required for securing work in place. Where required, carefully scribe finish pieces to uneven surfaces for neat appearance.
- d. All work shall be mitered and coped to conceal edgegrain. Trim and moldings to be in full lengths - no piecing of short lengths permitted unless approved by the Architect prior to installation.
- e. Install all flashing and caulking, as shown and as required, to insure weather tightness of building. Install exterior woodwork to provide drainage and weather tightness.

0660 FINISH CARPENTRY MATERIAL

- a. Interior Wood Trim:
 - 1) Use shapes and sizes and indicated on drawings.
 - 2) All interior wood trim shall be Face or better Poplar, finger-jointed clear Redwood, or tight knot spruce.
 - 3) Furnish and install wood trim with storefront and door frames. Trim shall be nominal 1" thickness in 1 x 4, 1 x 6, 1 x 8, and 1 x 10 shapes. Storefront windows shall receive a wood sill, skirt, and jamb and head trim members. Door frames shall be trimmed with wood jamb and head members.

END OF DIVISION SIX

DIVISION 7 MOISTURE PROTECTION AND INSULATION

0700 GENERAL:

- a. The provisions of the Instructions to Bidders, the General Conditions and the General Requirements of these Specifications shall govern the work under all Divisions or Sections the same as if incorporated therein and are binding on the Contractor and each Subcontractor.

0780 FIRESTOPPING

- a. Provide all firestopping indicated, specified or required to maintain fire ratings and separations shown on the drawings. This includes, but is not limited to:
 - 1) Penetrations through fire-resistance-rated floor and roof construction including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating item.
 - 2) Penetrations through fire-resistance-rated walls and partitions including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.
 - 3) Penetrations through smoke barriers and construction enclosing compartmentalized areas involving both empty openings and openings containing penetrating items.
 - 4) Sealant joints in fire-resistance rated construction.
- b. Quality Assurance:
 - 1) Through-penetration firestop system products shall bear classification marking of qualified testing and inspecting agency.
 - 2) Fire-Resistance Ratings of Joint Sealants: As indicated by reference to design designations listed by UL in their "Fire Resistance Directory" or by another qualified testing and inspecting agency. Joint sealants, including backing materials, bear classification marking of qualified testing and inspection agency.
 - 3) Installer Qualifications: Engage an experienced installer who has completed firestopping that is similar in material, design, and extent to that indicated for Project and that has performed successfully
 - 4) Single-Source Responsibility: Obtain through- penetration firestop systems for each kind of penetration and construction condition indicated from a single manufacturer.
 - 5) Provide firestopping products containing no detectable asbestos as determined by the method specified in 40 CFR Part 763, Subpart F, Appendix A, Section 1, "Polarized Light Microscopy."

- c. Provide Firestopping systems that are produced and installed to resist the spread of fire, according to requirements indicated, and the passage of smoke and other gases.
 - 1) F-Rated Through-Penetration Firestop Systems: Provide through-penetration firestop systems with F ratings indicated, as determined per ASTM E 814, but not less than that equaling or exceeding the fire-resistance rating of the constructions penetrated.
 - 2) T-Rated Through-Penetration Firestop Systems: Provide through-penetration firestop systems with T Ratings, in addition to F ratings, as determined per ASTM E 814, where indicated and where systems protect penetrating items exposed to contact with adjacent materials in occupiable floor areas. T-rated assemblies are required where the following conditions exist:
 - A. Where firestop systems protect penetrations located outside of wall cavities.
 - B. Where firestop systems protect penetrations located outside fire resistive shaft enclosures.
 - C. Where firestop systems protect penetrations located in construction containing doors required to have a temperature rise rating.
 - D. Where firestop systems protect penetrating items larger than a 4-inch-diameter nominal pipe or 16 sq. inches in overall cross-sectional area.
 - 1) Fire-Resistive Joint Sealants: Provide joint sealants with fire-resistance ratings indicated, as determined per ASTM E 119, but not less than that equaling or exceeding the fire-resistance rating of the construction in which the joint occurs.
- d. Submit shop drawings detailing materials, installation methods, and relationships to adjoining construction for each through-penetration firestop system, and each kind of construction condition penetrated and kind of penetrating item. Include firestop design designation of qualified testing and inspecting agency evidencing compliance with requirements for each condition indicated.
- e. Deliver firestopping products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer; date of manufacture; lot number; shelf life, if applicable; qualified testing and inspecting agency's classification marking applicable to Project; curing time; and mixing instructions for multicomponent materials. Store and handle firestopping materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.
- f. Compatibility: Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by firestopping manufacturer based on testing and field experience.
- g. Accessories: Provide components for each firestopping system that are needed to install fill materials and to comply with the specification herein. Use only components specified by the firestopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire-resistance-rated systems. Accessories include but are not limited to the following items:

- 1) Permanent forming/damming/backing materials
- 2) Temporary forming materials
- 3) Substrate primers
- 4) Collars
- 5) Steel Sleeves

- A. For firestopping exposed to view, traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions.
- B. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
- C. For floor penetrations with annular spaces exceeding four (4) inches or more in width and exposed to possible loading and traffic, provide firestop systems capable of supporting the floor loads involved either by installing floor plates or by other means.
- D. For firestopping exposed to view, provide products with flame-spread values of less than 25 and smoke-developed values of less than 450, as determined per ASTM E 84.

h. Fill Materials for Through-Penetration Firestop Systems:

- 1) Ceramic-Fiber and Mastic Coating: Ceramic fibers in bulk form formulated for use with mastic coating, and ceramic fiber manufacturer's mastic coating.
- 2) Manufacturer's shall be FireMaster Bulk and FireMaster Mastic, The RectorSeal Corporation, Fyre-Shield, Tremco, Inc., Flame-Safe, International Protective Coatings Corp., Metacaulk, 3M Fire Protection Products, General Electric Co., Dow Corning Corp., United States Gypsum Co., or approved equal.

i. Fire-Resistive Elastomeric Joint Sealants:

- 1) Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer indicated that complies with ASTM C 920 requirements, including those referenced for Type, Grade, Class, and Uses and requirements specified in this Section applicable to fire-resistive joint sealants.
- 2) Sealant Colors: Provide color of exposed joint sealants from manufacturer's full range of standard colors for products of type indicated.
- 3) Single-Component, Neutral-Curing Silicone Sealant: Type S; Grade NS; Class 25; exposure-related Use NT, and joint-substrate-related Uses M,G,A, and (as applicable to joint substrated indicated) O. Provide sealant with the capability to withstand the following percentage changes in joint width existing at time of installation, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, and remain in compliance with other requirements of ASTM C 920 for uses indicated: 50 percent movement in both extension and compression for a total of 100 percent movement.

- 4) Multicomponent, Nonsag, Urethane Sealant: Type M; Grade NS; Class 25; exposure-related Use NT, and joint-substrate-related Uses M, A, and O (as applicable to joint substrated indicated) O. Additional Movement Capability: Provide sealant with the capability to withstand the following percentage change in joint width existing at time of installation, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, and remain in compliance with other requirements of ASTM C 920 for uses indicated. 40 percent movement in extension and 25 percent in compression for a total of 65 percent movement.
 - 5) Single-Component, Nonsag, Urethane Sealant: Type S, Grade NS; Class 25; and Uses NT, M,A, and O(as applicable to joint substrates indicated)
 - 6) Manufacturer's shall be Dow Corning Co., General Electric, Pecora Corp., Mameco International, Inc., Sika Corp., Sonneborn Building Products Div., ChemRex, Inc., Tremco, Inc., Harry S. Petterson Co., Inc. or approved equal.
 - 7) Mixing: For those products requiring mixing prior to application, comply with firestopping manufacturer's directions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other procedures needed to produce firestopping products of uniform quality with optimum performance characteristics for application indicated.
- j. Examine substrates and conditions, with installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of firestopping. Do not proceed with installation until unsatisfactory conditions have been corrected. Do not install firestopping when ambient or substrate temperatures are outside limits permitted by firestopping manufacturers or when substrates are wet due to rain, frost, condensation, or other causes. Ventilate firestopping per firestopping manufacturer's instructions by natural means or, where this is inadequate, forced air circulation.
- k. Clean out openings and joints immediately prior to installing firestopping to comply with recommendations of firestopping manufacturer and the following requirements:
- 1) Remove all foreign materials from surfaces of opening and joint substrates and from penetrating items that could interfere with adhesion of firestopping.
 - 2) Clean opening and joint substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestopping. Remove loose particles remaining from cleaning operation.
 - 3) Remove laitance and form release agents from concrete.
 - 4) Prime substrates where recommended by firestopping manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

- 5) Use masking tape to prevent firestopping from contacting adjoining surfaces that will remain exposed upon completion of work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods use to remove smears from firestopping materials. Remove tape as soon as it is possible to do so without disturbing firestopping's seal with substrates.
- l. Install forming/damming materials and other accessories of types required to support fill materials during their application and in the position needed to produce the cross-sectional shapes and depths required to achieve fire ratings of designated through-penetration firestop systems. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems. Install fill materials for through-penetration firestop systems by proven techniques to produce the following results:
 - 1) Completely fill voids and cavities formed by openings, forming materials, accessories, and penetrating items.
 - 2) Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - 3) For fill materials that will remain exposed after completing work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.
 - m. Install joint fillers to provide support of sealants during application and at position required produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability and develop fire-resistance rating required.
 - 1) Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint width that optimum sealant movement capability. Install sealants at the same time joint fillers are installed.
 - 2) Tool nonsag sealants immediately after sealant application and prior to the time skinning or curing begins. Form smooth, uniform beads of configuration indicated or required to produce fire-resistance rating, as well as to eliminate air pockets, and to ensure contact and adhesion of sealants with sides of joint. Remove excess sealant from surfaces or are not approved by sealant manufacturer.
 - n. Clean off excess fill materials and sealants adjacent to openings and joints as work progresses by methods and with cleaning materials approved by manufacturers of firestopping products and of products in which opening and joints occur.

Protect firestopping during and after curing period from contact with contaminated substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated firestopping immediately and install new materials to produce firestopping complying with specified requirements.

0790 CAULKING AND SEALANTS

- a. All joints on the exterior shall be caulked where shown on drawings, or directed by the Architect, where dissimilar materials join, and to provide a weathertight and watertight building.
- b. Surfaces to be caulked or sealed shall be clean and dry and primed if required.
- c. Product Delivery, Storage and Handling:
 - 1) Deliver materials in original, tightly sealed containers or unopened packages with manufacturer's name, labels, product identification and lot numbers, where appropriate.
 - 2) Store materials out of the weather in original containers or unopened packages as recommended by the manufacturer.
- d. Caulking compound: Shall be an approved one-part, low modulus silicone elastomeric sealant meeting Federal Spec. TT-S-001543D. Apply in accordance with the manufacturer's printed instructions. Color shall match the joints of adjacent materials.
- e. Backer Rod: Closed cell polyethylene foam, compatible with sealant meeting Federal Spec. TT-S-00227E. The rod shall be sized and shaped to control depth of sealant and to provide 20% to 50% compression upon insertion.
- f. Miscellaneous Materials:
 - 1) Joint Cleaner: For metal and glass; Xylol, Toluol or Methyl Ethyl Ketone.
 - 2) Primer: Dow-Corning 1200 Primer.
 - 3) Bond Breaker: Pressure sensitive adhesive polyethylene tape.
 - 4) Masking Tape: Pressure sensitive adhesive paper tape.
- a. Execution:
 - 1) Preparation:
 - a) Investigate all joints. All dust, mortar particles, and other particles, and other foreign matter shall be removed. Clean joint surfaces using joint cleaner as necessary, to be free of dust dirt, oil, grease, rust oil, grease, rust, lacquers, latencies, release agents, moisture, or other material which might adversely affect adhesion of sealant.
 - b) Mask areas adjacent to joints where necessary to prevent staining.
 - c) Apply primer, following manufacturer's instructions.

2) Application:

- a) Install backing material in joints using blunt instrument to avoid puncturing. Do not twist rod while installing. Install backing so that joint depth is 50% of joint width, but a minimum of 1/4 inch deep.
- b) Apply sealant in joints using pressure gun with nozzle gun with nozzle cut to fit joint width. Make sure sealant is deposited in uniform, continuous beads without gaps or air pockets.
- c) Tool joints to required configuration within 10 minutes of sealant application. Remove masking materials immediately after tooling.

3) Cleaning:

- a) Remove excess materials adjacent to joints by mechanical means or with xylol or mineral spirits as work progresses to eliminate evidence of spillage or damage to adjacent surfaces.
- b) Leave finished work in neat, clean condition with no evidence of spillovers onto adjacent surfaces.

END OF DIVISION SEVEN

DIVISION 8 DOORS, WINDOWS, GLASS AND HARDWARE

0800 GENERAL

- a. The provisions of the Instructions to Bidders, the General Conditions and the General Requirements of these specifications shall govern the work under all Divisions or Sections the same as if incorporated therein and are binding on the Contractor and each Subcontractor.
- b. Some products and execution are specified in this section by reference to published specifications or standards of the following (with respective abbreviations used):

The American Society for Testing and Materials (ASTM) Underwriters' Laboratories, Inc. (UL) National Woodwork Manufacturers Association (NWMA) American Woodworking Institute (AWI)

- c. Submittals
 - 1) Shop drawings: Show typical construction and arrangement of all items. Show condition at doors and frames in various wall thicknesses and materials. Show hardware reinforcement, anchors, and sill clips. Include a schedule listing the location in the building of each item. Indicate UL labeled frames and doors.
 - 2) Underwriter's Labels: Provide door and/or frames with labels of Underwriters' Laboratories, Inc., where required in Door Schedule on drawings. Labels shall indicate compliance with class required in schedule and shall be furnished with metal labels securely attached to the door. Plastic or paper labels are not permitted on this project.

0820 HOLLOW METAL DOORS AND FRAMES

- a. Hollow Metal Doors and Frames
 - 1) Furnish and install hollow metal frames as shown on drawings, and as specified herein. See drawings and schedule for types, sizes, design and location of hollow metal frames and accessories.
 - 2) Hollow metal frames shall be manufactured by Steelcraft, Cincinnati, Ohio or approved equal as conforming to ANSI SD1-100 and the American with Disabilities Act of 1991.
- b. Materials
 - 1) Steel

- A. Commercial quality, carbon steel sheets, free from scale, pitting and surface defects. Gauges shall be U.S Standard.
- B. Steel for face sheets for broad frame faces, shall be stretcher-leveled.
- C. Sheet steel for exposed surfaces of frames for exterior openings shall be hot-dipped galvanized, phosphatized steel sheet with not less than light commercial zinc coating in accordance with ASTM A 526-71.

2) Shop Coating

- a. Primer: Manufacturer's standard rust-inhibitive baked primer over phosphatizing treatment.
- b. Zinc-Rich Primer: As approved by the Architect.

c. Fabrication

1) Hollow Metal Frames

- A. Fabricate all frame shapes as shown on drawings. Jamb widths as required. SEE DRAWINGS FOR DETAILS.
- B. Frames shall be manufactured of cold-rolled steel, except where shown otherwise in the Contract Documents. Fabricate frames from 16 gauge steel except where required otherwise in contract documents. Fabricate hollow metal frames for exterior openings from 14 gauge steel sheet.
- C. Corner joints shall have contact edges closed tight. Miter face. Cope backband, rabbet, and stops. Except where required specifically otherwise elsewhere in the contract documents, seal all joints fully in exterior frames - either by welding fully, or by use of a polysulfide caulking compound where joint is not welded. Grind exposed welds smooth, and with no depressions.
- D. At hardware locations, install reinforcing plates of the following thicknesses:
 - 1. Hinge and pivot reinforcements: 3/16" thick
 - 2. Reinforcement for closers: 3/16" thick
 - 3. Strike: 1/8" thick
 - 4. All other mortised and surface mounted hardware: 1/8" thick
- E. Weld reinforcement plates to inner surface of frame with a minimum of 6 welds per plate.
- F. Mortise, reinforce, drill, and tap doors at factory for fully templated hardware in accordance with approved hardware schedule and with templates supplied by the hardware supplier. Install reinforcements furnished by hardware supplier, in accordance with hardware manufacturer's templates furnished with reinforcement, except as modified herein. Provide 26 gauge galvanized plaster or mortar guards at hardware mortises on frames to be set in plaster partitions or masonry.
- G. Reinforce head of frames (over 3'6" wide openings) where installed in partitions with masonry continuing over frame. Reinforce with angle or channel stiffener fabricated from not less than 12 gauge steel, and not longer

than frame opening width. Weld reinforcing into head in shop. Such reinforcing shall not replace required lintels or load-carrying members.

- H. Provide a minimum of 3 anchors in each jamb. For frames over 7'2" in height, provide an additional anchor for each 2 ft. of height. Fabricate anchors from 14 gauge steel. Anchors shall be appropriate type for wall material.
- I. Provide floor clips of not less than 16 gauge steel for frames, fasten to bottom of frame for anchoring frame to floor construction.
- J. Before shipment, install a temporary spreader at bottom of frames. Do not remove until frames are secured in place.
- K. After fabrication, apply shop coats:
 - 1. Exterior frames shall be fabricated from galvanized-phosphatized sheet. Touch up weld areas, and areas where zinc coating has been damaged. Touch up with zinc-rich primer. Apply primed finish (to be finish-painted in field)
 - 2. Interior frames shall receive manufacturer's baked prime finish.
 - 3. Finished surfaces shall be smooth and free of irregularities.

2) Hollow Metal Doors

- A. Doors shall be flush type, 1 3/4" thick, formed of 16 gauge, stretcher-leveled, cold rolled steel sheets on both faces.
- B. Finished work shall be free from warping, bulge, or buckle. Corner bends shall be true, straight, and as sharp as possible for the gauge of metal used. Doors shall have no visible seams or joints on faces or stile edges.
- C. Core: Use one of the following:
 - 1. Internal Stiffeners: Stiffen face sheets by continuous, vertical, formed, sheet-steel sections occupying full depth of interior space between door faces. Stiffeners shall be not less than 22 gauges, spaced not more than 6 inches apart and securely attached to both face-sheets by spot-welds at not more than 4" on centers. Fill spaces between stiffeners for full height of door with a 6 to 7 lb. density, inorganic, non-combustible, batt-type material to sound-deaden and insulate door.
 - 2. Cellular Core: Fabricate core from resin-impregnated kraft paper formed into cellular structure with cells perpendicular to door faces, and not exceeding one inch in any dimension parallel to door faces. Faces shall be bonded to core with epoxy-based adhesive to provide permanent bond.
- D. Join faces at stile edges by a continuous weld extending full height of door. Welds shall be ground, filled, and dressed smooth to make them invisible; and to provide a smooth, flush surface.

- E. Close top and bottom edges of doors with a continuous, recessed steel channel of not less than 16 gauge sheet steel. Extend channel full width of door, and spot weld to both faces. Space holes in bottom closure of exterior doors to permit escape of entrapped moisture.
- F. Provide profiles on both stiles of door as follows: Single-acting swing doors: Beveled 1/8" in 2".
- G. Mortise, reinforce, drill, and tap doors at factory for fully templated hardware in accordance with approved hardware schedule and with templates supplied by the hardware supplier. Reinforcements shall be welded within doors. Where surface-mounted hardware is to be applied, provide only reinforcing plates in doors. Drilling and tapping for hardware will be done during installation in the field, except where noted specifically otherwise in the contract documents.
- H. Provide reinforcing plates for hardware of the following minimum gauges:
 - 1. Hinge and pivot reinforcement: 7 gauge
 - 2. Reinforcement for lock face, flush bolts, concealed holders, concealed and surface mounted closers: 12 gauge.
 - 3. Reinforcement for other surface-mounted hardware: 16 gauge.
- I. Finish: Treat all surfaces chemically to insure cleaning and maximum adhesion of finish. Install shop coat of rust-inhibitive primer.

d. Installation

- 1) Door and frames shall be installed in accordance with the recommendations and shall meet the minimum standards of the Door and Hardware Institute Publication, "The Installation of Commercial Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builders Hardware".
- 2) Install frames plumb, rigid, and in true alignment. Brace properly until built into wall.
- 3) Inspect frames for plumbness and correct positioning before being tied finally into masonry or metal stud wall system. Frames installed out of correct position shall be torn out and replaced.
- 4) Secure door frames to floor with a countersunk expansion device at each jamb. Build anchors into walls as the work progresses.
- 5) Hang doors plumb and true, with doors making uniform contact with metal frames on all sides. Doors that cannot be hung to fit evenly on all sides shall be removed and replaced.

0830 WOOD DOORS

- a. Furnish and install wood doors where called for on the drawings and as specified herein.
- b. Wood doors shall be solid core with core conforming to ANSI STD A208-1-LD-2 covering mat formed particleboard.
- c. Face shall be factory finished with standard birch veneer overlay. Factory finish doors in accordance with WDMA Finish System Description or AWI Division 1500-S-4 – Finish System Standards. Factory finish to be water based stain and infrared cured waterborne lacquer to comply with DPA Title 5 guidelines for Volatile Organic Compound (VOC) emissions limitations. Finish must meet or exceed performance standards of TR-3 waterborne lacquer. Color shall be selected from manufacturer's standard colors. Doors to be installed just prior to Substantial Completion.
- d. Doors shall be furnished with lights as called for on the Door Schedule.
- e. Provide fire rated doors as called for on the Door Schedule and as indicated in rated assemblies noted on the drawings.
- f. Wood doors shall meet or exceed the standards set forth in AWI Quality Standards and Guide Specs Section 1300 "Architectural Flush Doors".
- g. Install all doors plumb, free operating to close tight against stops.
- h. All doors shall be made in accordance with the Commercial Standard 171-58 and shall be guaranteed according to the Standard Door Guarantee of the NWMA.
- i. Door Schedule - See Drawings

0871 MIRRORS

- a. Where shown on the drawings furnish and install mirrors as indicated. Method of setting and securing to wall or assembly shall be approved by Architect prior to installing mirror.
- b. Mirrors shall be 1/4" plate glass, copper backed with stainless steel frames.

0885 FINISH HARDWARE

1.1 QUALITY ASSURANCE

- A. Acceptable Designs: Specified products and their manufacturers establish acceptable design, material, type, grade, size, function, and finish of hardware items required. Do not substitute other products, except with Architect's acceptance.

- B. **Manufacturer:** Obtain each kind of hardware [latch and locksets, hinges, closers] from only one manufacturer, although several may be indicated as offering products complying with the manufacturer's requirements.
- C. **Supplier:** The hardware supplier shall be a full member of the Society of Architectural Hardware Consultants and shall be available during normal working hours during the course of the project for hardware consultation to the Owner, Architect, and Contractor.
- D. **Hardware Allowances:** The Contractor shall include in his bid the sum of FIVE THOUSAND DOLLARS (\$5,000.00) for purchase of and delivery to the site all builders (finish) hardware, including such sales and other tax as applicable.

1.2 SUBMITTALS

- A. **Product Data:** Submit in accordance with the requirements of Section 01300. Include installation and maintenance instructions for operating parts and finish. Transmit copy of applicable data to Installer.
- B. **Certificates:** Any hardware that is furnished other than that scheduled on the drawings shall have manufacturer's certificates certifying that the hardware meets this specification submitting the hardware shop drawings.
- C. **Hardware Schedule:** Submit final hardware schedule in the manner and format indicated below. Hardware schedules are intended for coordination of work.
 - 1. Organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door or opening, including:
 - a. Type, style, function, size and finish of each hardware item.
 - b. Name and manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of hard set cross-referenced to indications on Drawings both on floor plans and in door and frame schedule.
 - e. Explanation of all abbreviations, symbols, code, etc. contained in schedule.
 - f. Mounting locations for hardware.
 - g. Door and frame sizes and materials.
 - 2. Submit schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work [e.g. hollow metal frames], which is critical in the project construction schedule.
 - 3. Include product data, samples, shop drawings of other work affected by builder's hardware, and other information essential to the coordinated review of hardware schedule.

4. Templates: Furnish for the installation of all hardware and to the manufacturer of related equipment for his preparation of that equipment for all hardware that must be attached thereto. Templates shall also be furnished to the manufacturer of wood doors for use on all wood doors that are factory fitting and factory machined for hardware.
- D. Keying Schedule: Submit separate detail schedule indicating clearly how the Owner's final instruction on keying of locks has been fulfilled. Prior to submittal, blank key schedule to be completed by maintenance personnel.

1.3 JOB CONDITIONS:

- A. Coordinate hardware with other work. Tag each item or package separately with identification related to the final hardware schedule. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing, security, and similar requirements indicated as necessary for proper installation and function. Deliver individually packaged hardware items at the proper times to the proper location [shop or project site] for installation.
- B. Packing and Marking: Package each item of hardware separately in individual containers, complete with necessary screws, keys, instructions and installation templates for spotting mortising tools. Mark each container with item's number corresponding to number shown on hardware supplier's schedule and properly tag each cylinder's key.
- C. Provide secure lock-up for hardware delivered to the project but not the installed. Control the handling and installation of hardware items, which are not immediately replaceable, so that the completion of the work will not be delayed by hardware losses, both before and after installation.
- D. Templates: Furnish hardware templates to each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware. Upon request, check the shop drawings of such other work to confirm that adequate provisions are made for the proper installation of hardware.
- E. Inspection of Hardware and Installation: The hardware supplier shall visit the project when the hardware is delivered and check it before it is installed. He shall visit the project again after all the hardware has been installed and shall notify the Architect if there is any hardware that has not been installed correctly. Contractor and supplier shall furnish Architect with written certification to this effect. After the hardware is installed, the hardware supplier shall meet with the Owner or his representative and explain the functions, uses, and maintenance of all types of hardware installed. The Contractor shall turn over to the owner, after completion of the work, all tools, wrenches and templates that come packaged with the hardware for the Owner's use in servicing the hardware. The hardware supplier shall adjust the door closers for proper operation with particular attention being given to final operation of the air conditioning, heating and ventilating system.

PART 2 - PRODUCTS, MATERIALS, FABRICATION AND FINISHES

2.1 PRODUCTS:

A. Acceptable Manufacturers:

1. Hinges: Bommer, McKinney, Stanley
2. Continuous Gear Hinges: ABH, Select, Zero
3. Cylinders: Best, Corbin Russwin, Schlage
4. Door Closers: RYOBI, LCN, Norton
5. Locks, Latches: Best, Corbin Russwin, Schlage
6. Silencers, Stops & Flush Bolts: Baldwin, Ives, Rockwood
7. Kick Plates, & Misc.: Baldwin, Ives, Rockwood
8. Weatherstrip: National Guard, Pemko, Zero
9. Push/Pulls: Baldwin, Ives, Rockwood
10. Exit Devices: Precision, Sargent, Von Duprin
11. Thresholds: National Guard, Pemko, Zero
12. Overhead Stops/holders: ABH, Glynn-Johnson, Rixson
13. Electronics: RCI, Locknetics, Best
14. Auto Operators: Hunter, Beasam, LCN

B. General:

1. Manufacturer's Name Plate: Do not use products which have manufacturer's name or trade name displayed in a visible location except in conjunction with required UL labels.
2. Unless otherwise noted, exposed hardware items shall receive satin stainless steel finish.
3. Furnish screws of type as required for substrates indicated with each hardware item. Finish exposed screws to match the hardware finish or, if exposed in surfaces of other work, to match the finish of such other work as closely as possible.
4. Unless otherwise noted, provide concealed fasteners for hardware units that are exposed when door is closed. Where fasteners must remain exposed when door is closed. Where fasteners must remain exposed, provide vandal resistant fasteners.
5. Finish shall be as scheduled. Dull Chrome [US26D], Dull Stainless Steel [US32D] Aluminum Lacquer [AL], Extruded Aluminum [Alum] and Prime Coat [USP] as listed.
6. Tools for maintenance: Furnish a complete set of specialized tools as needed for Owner's continued adjustment, maintenance and removal and replacement of builder's hardware.

7. Hardware Operation: Force required to activate door hardware shall be not greater than 5 lbf.
8. Door Opening Force: Maximum force for pushing or pulling open a door shall comply with this paragraph. For hinged doors the force shall be applied perpendicular to the door at the door opener or 30 inches from the hinged side whichever is farther from the hinge.
 - a. Exterior hinged doors shall not exceed 8.5 lbf. Slight increases in opening force shall be allowed where 8.5 lbf. is insufficient to compensate for air pressure differentials.
 - b. Interior hinged doors shall not exceed 5.0 lbf.
 - c. Fire doors shall be adjusted to meet the minimum opening force permitted by governing fire safety standards.

C. Hinges:

1. Provide template-produced hinges complying with ANSI A156.1.
2. Provide stainless steel pins, non-removable type for exterior doors and non-rising types for interior doors. Pins shall have flat button ends finished to match hinge leaves.
3. Hinges shall be full-mortised, 4½” x 4½” unless otherwise noted; five knuckle ball bearing type, heavy duty rated.

D. Lock Cylinders and Keying:

1. Metals: Construct lock cylinder parts from brass/bronze, stainless steel, or nickel silver.
2. Equip locks with manufacturer's construction master key feature that permits voiding of construction keys without cylinder removal.
3. Comply with the Owner's instructions for master keying and, except as otherwise indicated, provide individual change key for each lock which is not designated to be keyed alike with a group of related locks.
4. Key Material: Provide keys of nickel silver only.
5. Key Quantity: Furnish three keys for each lock and four keys for each master key, four Grand Master Keys, four Great Grand Master Keys.

6. Permanently inscribe each key with number or lock that identifies cylinder Manufacturer's key symbol.
7. Keying: Key into existing Great Grand Masterkey System as directed by the Architect and/or Owner. Furnish four (4) Grand Masterkeys, four (4) Masterkeys, three (3) keys per lock.
8. Key Cabinet: Furnish a key cabinet of sufficient size to accommodate this work plus 50%. Lund, Key Control and Telkee are acceptable.

E. Locks and Latches:

1. Strikes: Except as otherwise indicated or specified, provide manufacturer's standard wrought box strike for each latch or lock bolt with curved lip extended to protect frame, finished to match hardware set.
2. Handles and knobs: Provide manufacturer's lever handle set complete with stem, roses and trim unless otherwise noted.
3. Lock throw: Provide 1/2" minimum throw on doors.

F. Exit Devices: Exit devices shall be as scheduled with no substitutes accepted. Exit devices shall comply with ANSI Standard 156.3 Grade 1 modified as follows:

1. The devices shall be "touchpad" type with touchpad, which shall extend a minimum of 1/2 of the door width.
2. Devices should have a 1/4" gap between the face of the door and the touchbar unit eliminating the need for shims or cutting away the glass bead.
3. Lock stile chassis shall be cast bronze. Stamped steel units will not be accepted. All device latchbolts shall be extruded bronze and where used in vertical rod devices shall be deadlocking type.
4. Device strikes shall be investment cast stainless steel.
5. Device end cap shall be all metal and secured with bracket that completely inserts into device housing.
6. All outside device trim shall be cast or forged brass full escutcheon. Lever trim shall be "vandal resistant" with substantial resistance to rotation when locked.
7. All vertical rod devices shall be concealed and have "latch retraction" hold back.
8. Devices must be convertible from one function to another simply by exchanging back plate assembly in lock stile case and selecting proper outside trim.

9. Device shall be secured to the door with sex bolts and through bolting at both ends.
10. All devices shall be UL approved for all types and functions indicated in the Hardware Schedule.
11. Devices shall have published three-year warranty.
12. All exit devices shall be by the same manufacturer.
13. Mullions shall be “keyed removable” type with only a key required for take down. No key or tools shall be required to reinstall. Mullions shall be by the same manufacturer as the exit devices.

G. Closers: Shall be as scheduled.

1. Closer shall be non-handed and adjustable.
2. Closer shall have R14 high silicone aluminum alloy cylinder body with 1 ½” steel piston.
3. Closer shall have ten year warranty.
4. Closer shall have all season fluid to eliminate seasonal adjustment.
5. All closers mounted parallel arm shall have EDA arm.

H. Overhead Stops/Holders: Shall be as scheduled - No Sub.

1. Units shall have metal/plated end plugs.
2. Units mounting screws shall be designed so that they go through housing and end plug.
3. Units shall have metal slide.
4. All stops shall be by same manufacturer.

I. Silencers, Stops & Flush Bolts: Shall be as scheduled.

1. Silencers: Provide plug-type [not adhered type] silencers in all metal door frames unless continuous bumper-type weather-stripping is shown or specified. Provide 3 silencer units in door frames.
2. All Stops [wall and floor] shall be by the same manufacturer.
3. Flush bolts shall have 3/4" throw with 2" vertical adjustment. Shall have override feature and stainless steel cams and rubplates. All flush bolts shall be by the same manufacturer.

- J. Door Stripping and Seals: Unless otherwise indicated, provide full-length weather-stripping at each edge of every exterior swing door leaf. All weather-stripping to be by same manufacturer.
- K. Thresholds: Extruded aluminum, smooth commercial mill finish, grooved tread, 4" minimum tread by full door width. Thickness of threshold shall be 0.5" at primary tread surfaces, 0.1875" for secondary tread surfaces, and 0.125" for concealed flanges and legs.
- L. Kick Plates, Mop Plates and Armor Plates: .050 material sized as follows:
 - Kick Plates: 8 x 2 LDW
 - Mop Plates: 4 x 2 LDW
 - Armor Plates: 16 x 2 LDW

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Properly tag, index, and file all keys until turned over to the Owner. Apply hardware in accordance with templates and manufacturer's instructions; mortise and fit accurately; apply securely and adjust carefully.
 - 1. Mount hardware units at heights recommended in "Recommended Locations for Builders Hardware" by DHI, except where shown otherwise on drawings.
 - 2. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Do not install surface mounted items until finishes have been completed on the substrate.
 - 3. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
 - 4. Exercise care not to injure work when applying hardware. Review shop drawings and Contract Drawings for proper location. Cover door hardware with a heavy cloth until painting is completed. At completion of the work, examine doors and hardware, adjust as required and leave hardware in proper working order, free from defects.
 - 5. At all times be responsible for the distribution of keys for hardware installed during construction, and cause all keys to be returned prior to final completion of the building
- B. Preparation:
 - 1. Do not install finish hardware until the wet trades have been fully completed.
 - 2. Supplier shall mark each item of hardware for location. Protect markings until each item is installed. If any item of hardware is delivered to the Project not properly marked, return it to the supplier for marking before attempting to install it.

3. Install and make necessary adjustments for proper working order. Hardware damaged by improper adjustments or abuse will be rejected.
4. Provide clean, properly sized, and accurately placed mortises and drilled holes for all mortise and surface mounted finish hardware. Use appropriate jigs, templates, and power mortising equipment for the installation of all mortised hardware items.
5. Metal frames to receive hardware items shall be drilled and tapped accurately.
6. Removal for Painting:
 - a. Before painters' finish is applied, remove all finish hardware except prime-coated items.
 - b. After final paint and finish coats are dry, permanently replace and adjust finish hardware for proper operation.

C. Thresholds:

1. Cut and fit threshold to profile door frames, with mitered corners and hairline joints. Screw thresholds to substrate with No. 10 or larger bronze or stainless steel screws.
2. Set thresholds in a bed of either butyl/rubber sealant or polyisobutylene mastic sealant to completely fill concealed voids and exclude moisture from every source. Do not plug drainage holes or block weeps. Remove excess sealant.

D. Weatherstrip: Accurately install weatherstrip to the door or frames where scheduled using proper type flush fasteners spaced not over 18" o.c. Installed work shall make continuous contact with the abutting surfaces and shall function for use intended. Adjust seals as required.

E. Mounting Heights: Shall be as follows, measured from finished floor except for top hinge which is measured from door top:

1. Bottom hinge: 10-3/8" [hinge center].
2. Top hinge: 9-3/4" [hinge center]
3. Intermediate hinges: Equally spaced between top and bottom hinges.
4. Locks and latches: 38" [operating spindle].
5. Pulls, pull and push plates: 42" [center].

3.2 ADJUST AND CLEAN:

A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Lubricate moving parts with type lubricant recommended by manufacturer [graphite-type if no other recommended]. Replace units

- B. Upon completion of the work and before final acceptance demonstrate that all hardware is in satisfactory working order, that all keys fit in their respective locks, and upon acceptance of the work, tag and deliver all keys to the Owner.
- C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy and make a final check and adjustment of all hardware items in such space or area. Clean and re-lubricate operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- D. Instruct Owner's personnel in proper adjustment and maintenance of hardware and hardware finish during the final adjustment of hardware.

END OF DIVISION EIGHT

DIVISION 9 FINISHES

0900 GENERAL

- a. The provisions of the Instructions to Bidders, the General Conditions and the General Requirements of these Specifications shall govern the work under all Divisions or Sections the same as if incorporated therein and are binding on the Contractor and each Subcontractor.

0910 SUSPENDED CEILING: Contractor shall furnish and install a suspended grid ceiling system where indicated as a finish material on the drawings and as specified herein.

- a. Panel
 - 1) 24" x 24" x 5/8" "Fine Fissure" 1728 by Armstrong or approved equal.
 - 2) Color shall be as selected by Architect from standard colors.
- b. Grid System: Use exposed grid "Prelude XL – 15/16" (with 2" wall moulding as required by seismic zone) by Armstrong or approved equal. Lock joint type with main runners spaced 2'-0" o.c. max.; all to be securely anchored to structural system; install level and true. Any exposed face or surfaces shall match acoustical tile color. System shall be as recommended by manufacturer of ceiling panels to accommodate panels, lighting system, and meet required fire resistance rating.
- c. Install panel and grid system as recommended by the manufacturer and as per ASTM C-635, ASTM C-636 and E-508 (for areas of moderate seismic restraint)

0925 GYPSUM DRYWALL

- a. Gypsum Wall Board: 5/8" regular gypsum board and 5/8 F.C. gypsum board by U.S.G. or approved equal.
- b. Installation: Use screws as recommended by the manufacturer of the gypsumboard.
- c. Joint reinforcing and adhesive materials: As recommended by the manufacturer of the gypsum wall board.
- d. Install all materials in accordance with manufacturer's directions and with the best practices of the trade. In cold weather maintain a uniform temperature in range of 55-75 degrees F.
- e. Metal Accessories: Corner beads shall be galvanized steel 1" x 1-1/4". Casing beads and trim shall be galvanized steel.

- f. Water-resistant board: In all restroom, toilet, laundry, shower and kitchen spaces use water resistant board including Firecode X where fire rating is required water resistant board shall be manufactured by U.S.G. or approved equal.

0928 CARPET

- a. Where carpet is indicated as a finish material, furnish and install carpet as specified herein.
- b. Carpet shall be installed using direct glue down method in accordance with the Handbook for Carpet Layers, published by the Carpet Institute, Inc.
- c. The Contractor shall allow twenty four (\$24.00) dollars per square yard in his bid for the purchase and delivery of carpet (including such sales and other tax as is applicable) where carpet is included as a finish material. Cost of installing carpet shall be included in the Base Bid (not in the allowance.)

0965 VINYL COVE BASE

- a. Furnish and install vinyl cove base where called for on the drawings and as specified herein. Install as per manufacturer's recommendations.
- b. Base: Vinyl cove standard toe base as manufactured by Johnsonite or approved equal.
- c. The base shall conform full to the requirements of Federal Specification SS-W-40a, Type II, Vinyl Plastic, Class 1 (vinyl chloride).
- d. Size: 1/8" thickness x 4" height x 120' coil.
- e. Corners: Use 1/8" thick x 4" high inside and outside corners matching standard toe base.
- f. Color: As selected by Architect.

0966 VINYL ACCESSORIES

- a. Furnish and install vinyl floor accessories where required to transition between different floor materials.
- b. All vinyl accessories to be provided by the same manufacturer as the vinyl cove base and meet the Federal Specification.
- c. Colors to be selected by the Architect from manufacturer's standard colors.

- d. Provide 24 – 1” clear vinyl corner guards approximately 72” high, at all interior gypsum board wall corners. Locations to be selected by the Architect.

0970 RESILIENT FLOORING:

- a. Furnish and install resilient flooring as called for on the drawings and as specified herein. All materials, workmanship and installation shall be in strict accordance with manufacturer's current recommendations and specifications. Only new resilient flooring materials may be used. The resilient flooring materials as packaged by the manufacturer, in an undamaged condition, shall be stored on site 24 hours prior to their installation with seals and labels intact. Adhesives and other application materials shall be those as recommended by the manufacturer of the material specified.
- b. The General Contractor shall provide a constant temperature of at least 70 degrees F to not more than 90 degrees F. 48 hours prior to installation, during installation, and 48 hours after installation. A minimum temperature of at least 55 degrees F. shall be maintained thereafter.
- c. All surfaces to receive resilient flooring shall be dry, clean, and smooth. Subfloor surfaces shall not vary more than 1/8 inch in any ten foot dimension. Neither shall they vary at a rate greater than 1/16 inch per running foot. Defective areas shall be corrected by the trade involved. Subcontractor shall investigate the acceptability of the surface and construction for materials specified, and shall indicate adverse conditions of any type by letter to the General Contractor, with copy to the Architect. Any work started by the Subcontractor shall indicate acceptance of the work conditions by the subcontractor and thereafter, he shall be responsible for satisfactory results as required herein.
- d. BioBased Tile: 12" x 24" x 1/8" Striations by Armstrong or approved equal. (Color as selected by Architect – may be in multiple color patterns).
- e. The Contractor shall submit to the Architect three (3) samples of each color and pattern of flooring selected.
- f. Lay resilient flooring true, level and with tight, aligned joints. (NOTE: Floor tile will be set in a checker-board pattern using up to four separate colors of tile in combination.)
 - 1) Lay out pattern in accordance with manufacturer's instructions.
 - 2) Carry floor patterns from corridor into adjacent rooms and spaces.
 - 3) Align joints with longitudinal building axis as by Architect on job.
- g. Immediately upon completion of resilient flooring in a room or area, the subcontractor shall dry-clean floors and adjacent surfaces with a cleaner approved by the manufacturer of the resilient flooring. Floors shall not be washed for five (5) days after installation. The General Contractor shall wash floors with non-alkaline cleaning solution approved by manufacturer of the resilient flooring prior to final cleaning and polishing.

- h. All resilient flooring shall be cleaned, sealed and polished in strict accordance to “Armstrong Maintenance Recommendations and Procedures for Commercial Resilient Flooring”. Included but not limited to the application of Armstrong S-490 floor stripper, Armstrong S-495 floor sealer and a minimum of two coats of Armstrong S-480 floor polish (or approved equal).

0990 PAINTING

a. General:

- 1) The Contractor shall provide all necessary labor, materials and equipment to complete the painting as indicated on the plans and covered by the specifications.
- 2) The work in general includes all exterior and interior ferrous metal, all exterior and interior woodwork, concrete blocks, and all gypsum wallboard and other items normally requiring a paint finish unless otherwise instructed. Do not paint where the natural finish of the material is obviously intended and specifically noted as a surface not to be painted. Where items or surfaces are not specifically mentioned, verify with the Architect. Paint all items normally expected to be painted on a project of this type, nature and scope unless otherwise excepted
- 3) Items not requiring a paint finish, unless otherwise specified, are copper, bronze, nickel, stainless steel and acoustical tile.
- 4) The term "paint" as used herein means all coating systems materials which includes primers, emulsions, enamels, sealers, stains and fillers and other applied materials whether used as prime, intermediate or finish coats. No paints containing more than one percent of lead will be permitted for use on the project.
- 5) Do not paint over any code-required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.

b. Materials:

- 1) All paints and stains shall be of standard brands and the product of United Technologies, Sherwin-Williams, Olympic, Pratt & Lambert, Glidden, or approved equal.
- 2) All paints shall be delivered to the project in original with labels intact and seals unbroken.
- 3) All materials are to be applied according to manufacturer's label instructions.
- 4) Unspecified materials such as shellac, turpentine, thinners, etc., shall be of highest quality and have identifying labels on containers.

c. Colors and Samples:

- 1) Colors shall be as indicated in the color schedule which will be furnished the Contractor after award of the contract.

- 2) Samples: Submit for approval not less than three weeks before any painting is scheduled to start. New samples shall be submitted to replace rejected samples. Obtain approval in writing before delivering materials.
- 3) Approval: Material furnished shall match approved sample in color and sheen. Insofar as practicable, paint shall be factory mixed for application to surfaces involved without thinning or other adulteration on job, except as modified below.
- 4) Field Adjustment of Final Colors: Minor tinting to adjust finish coat to either lighter or darker shade shall be done in field as directed. Extensive changes in color shall be done in field if required, and an adjustment will be made in contract price to cost - a change order amount being agreed upon in advance.

d. Workmanship:

1) Job, Weather and Temperature Conditions:

- a) Do no exterior painting when temperature is below 50 degrees F, while surface is damp, or during cold, foggy, rainy or frosty weather, or when temperature is likely to drop to freezing within 24 hours. Avoid painting surfaces while they are exposed to hot sun.
- b) Maintain temperature in building at constant 65 degrees F. or above during drying of gypsumboard, and provide adequate ventilation for escape of moisture from building, in order to prevent mildew, damage to other work, and improper drying of paint. Once has commenced, provide constant temperature 65 degrees F. or above, and prevent wide variations in temperature which might result in condensation on freshly painted surfaces.
- c) Before painting is started in any area, broom-clean it, and remove excessive dust from all areas to be painted. Broom-cleaning, after painting operations begin in a given area, will not be allowed; cleaning shall then be done with only commercial vacuum cleaning equipment.
- d) Provide adequate illumination in all areas where painting operations are in progress.

2) Cooperation with Other Trades:

- a) Schedule this work and coordinate it with other trades and do not proceed until other work and/or job conditions are as required to achieve satisfactory results.
- b) Examine drawings and specifications for the work of various other trades and become familiar with all their provisions regarding painting. Surfaces that are left unfinished by requirements of other sections shall be painted or finished as part of the work covered by this section.

- 3) Inspection of Surfaces: Examine surfaces to receive paint finishes, in accordance with Contract Conditions, for defects which cannot be corrected by procedures specified herein and which might prevent satisfactory painting results. Do not proceed with work until such are corrected. Commencing of work constitutes

e. Execution:

1) Labor, Tools and Material

- a) Only skilled mechanics shall be employed. Application may be by brush, roller or spray, at Contractor's option, except for specific cases specified otherwise.
- b) Keep equipment clean and in condition to provide quality job specified.
- c) Materials shall be mixed, thinned, modified and applied only as specified by manufacturer's directions on container.
- d) Successive coats of material applied to a surface shall be of compatible chemical composition.

2) Colors and Scheduling:

- a) Secure approval of color samples before applying any paint or finish. Priming coats and undercoats shall be tinted to approximate shade of final coat.
- b) Furnish schedule showing when respective coats of paint for the various areas and surfaces are to be applied. Keep schedule current as job progress. If Architect so directs, succeeding coats shall not be applied until he has had an opportunity to inspect complete coat.

3) Protection:

- a) Protect not only painted surfaces at all times, but also protect adjacent work and materials by suitable covering or other method during progress of work. Upon completion of work, remove all paint and varnish spots from floors, glass, and other surfaces. Remove from premises rubbish and accumulated materials of whatever nature not caused by others and leave work in, orderly and acceptable condition.
- b) Remove and protect hardware, accessories, device plates, lighting fixtures, factory finished work, and similar items; or provide ample in-place protection. Upon completion of each space, carefully replace all removed items. This work shall be done only by mechanics using adequate tools commensurate with work to be done.
- c) Remove electrical panel box covers and doors before painting wall. Paint separately and reinstall after all paint is dry.

4) Application:

- a) Apply materials evenly spread and smoothly flowed on type and sizes of brushes, roller covers, bucket grids and spray equipment required to avoid runs, sags, holidays, brush marks, air bubbles and excessive roller stipple. Paint shall be applied in the number of coats specified and at the manufacturer's recommended dry film thickness or thicker.

- b) Coverage and hide shall be complete. When color, stain, dirt, or undercoats show through final coat of paint, cover surface with additional coats until paint film is of uniform finish, color, appearance and coverage. The number of coats specified herein the various finishes are customarily sufficient to obtain a satisfactory finish but the Contractor shall apply additional coats as required and shall retouch as necessary to secure a finish satisfactory to the Architect. This shall be done at no additional cost to the Owner.
 - c) Coats shall be thoroughly dry before application of succeeding coats.
 - d) Enamel or varnish finish applied to wood or metal shall be sanded with fine sandpaper and then cleaned between coats to produce an even, smooth finish.
 - e) Seal wood doors on tops and bottoms with prime coat only. Side edges of doors shall be finished same as face of doors.
- 5) Back Priming: In addition to priming and finishing coats herein specified, backprime concealed surfaces of plywood, millwork, all exterior wood trim, siding, and face boards, and ungalvanized metal items with one coat primer or wood stain as specified herein.
- 6) Priming, back-painting and back-staining shall be done immediately after items to receive this treatment are delivered to job, except steel, which shall be primed at shop.
- 7) Preparation of Surfaces:
- a) General: Surfaces shall be clean, dry and protected from dampness. Moisture content shall not exceed 20% as tested with a moisture testing meter. Test areas frequently enough to assure that no finish is applied to surfaces with moisture in excess of above limitation. Surfaces shall be smooth, even and true to plane. Surfaces shall be free of any foreign material which will adversely affect adhesion or appearance of applied coating. Remove mildew and neutralize by scrubbing areas thoroughly with a solution made by adding 2 ozs. of Tri-Sodium Phosphate type cleaner (Dirtex, Spic 'n' Span) and 8 ozs. of Sodium Hypochloride (Chlorox) to 1 gallon of warm water. Use a scouring powder if necessary to remove mildew spore. Rinse with clear water and allow to dry thoroughly before painting.
 - b) Wood: (1) Painted or enameled: Sand smooth. Wash sap spots and knots with mineral spirits. When dry, touch up spots, knots and sap wood on interior with shellac sealer and on exterior with aluminum paint. After prime coat has dried, fill voids with a putty tinted to final color. (2) Stained Finishes: Sand smooth and free of marks or discoloration. Install first coat and allow to dry. After review by Architect install second coat of stain if so instructed.
 - c) Gypsum Board and Fiber Reinforced Cement Board: Fill all minor irregularities with spackling compound and sand to a smooth, level surface. Lightly sand gypboard between successive coats of paint. Exercise care to avoid raising nap of paper.

- d) Steel and Iron: Remove dirt and grease with mineral spirits and wipe dry with clean cloths. Remove rust, mill scale, and defective paint down to sound surface, using scraper, sandpaper or wire brush as necessary. Grind if necessary to remove shoulders at edge of sound paint to prevent flaws from photographing through finish coats. Touch up bare metal and damaged shop coats with specified rust- inhibitive primer. Necessary touching up of shop primer shall be done on ferrous metal surfaces of items installed adjacent to plaster, concrete, masonry and stucco, prior to any openings between metal surfaces and adjacent surfaces being filled in or caulked. For ferrous surfaces with shop coats touched up as above required, the first coat as listed in the following schedule, may be omitted.
- e) Galvanized Surfaces: Remove dirt and grease with mineral spirits and wipe dry with clean cloth. Pretreat galvanized steel surfaces with proprietary acidbound resinous or crystalline zinc phosphate preparation prior to painting, unless manufacturer of primer used directs otherwise.
- f) Masonry surfaces shall be free of oil, grease or other foreign matter. Masonry cracks shall be cleaned out and patch filled with mortar and/or caulking. Remove all loose masonry with wire brush.
- g) All efflorescence shall be removed by scrubbing affected surfaces with 10% solution muriatic acid and rinsed with clear water and allowed to dry thoroughly.

f. Schedule of Painting - Exterior:

Use products by Sherwin-Williams or approved equal.

Note: Tint primer coats to finish coat colors. Paint all areas and components as disturbed by new work. Paint to the aesthetic edge of the disturbed areas and systems.

- 1) STEEL AND IRON: First coat primer, 1-0969 Heavy Duty R.I.P. (Grey); 2 finish coats, Ten Year House Paint. (60- line)
- 2) GALVANIZED METAL: 1 coat galvanized primer, Paint (1- 5993) (latex), 2 coats Ten Year House paint.
- 3) WOOD-PAINTED: First coat, Acri-Prime (60 line) 60-1074; 2 finish coats, Ten Year House Paint (latex), 60 line.
- 4) SYNTHETIC STUCCO: selected from standard finish by Manufacturer.

g. Schedule of Painting - Interior:

- 1) STEEL AND IRON: First coat primer, 1-0969 Heavy Duty R.I.P. (Grey); 2 finish coats Ten Year House Paint. (60-line)
- 2) GALVANIZED METAL: First coat galvanized primer, 1-0969 Heavy Duty R.I.P. (Grey); 2 finish coats Ten Year House Paint. (60-line)
- 3) WOOD-PAINTED: 1 coat enamel primer undercoater (34-0134); 2 coats semi-gloss enamel latex (90 line).
- 4) WOOD-STAINED: 1 coat (or 2 if required) Sure-Stain (20 line); 2 coats polyurethane varnish satin (41-0792)
- 5) SYNTHETIC STUCCO: Selected from standard finish by Manufacturer.
- 6) CABINET WORK: Finish by cabinet manufacturer.

- 7) GYPSUMBOARD: 1 coat Sealz (27-1876); 2 finish coats (200 line) latex flat. (Use semi-gloss in areas receiving tile-backer board).
- 8) EXPOSED CONCRETE BLOCK: 1 coat Vina-Prime latex block filler (26-1646); 2 coats Vina-Lux semi-gloss (90 line latex) (Quality of gloss finish shall be approved by Architect before installation of final coat).

END OF DIVISION NINE

DIVISION 10 SPECIALTIES

1000 GENERAL

- a. The provisions of the Instructions to Bidders, the General Conditions and the General Requirements of these Specifications shall govern the work under all Divisions or Sections the same as if incorporated therein and are binding on the Contractor and each Subcontractor.

1010 MARKERBOARDS, TACKBOARDS, AND TACKSTRIPS

- a. Furnish and install all ready framed porcelain steel markerboards, tackboards and tackstrips as shown on the drawings and as specified herein. (See drawing sheet A-2 for typical elevation).
- b. All markerboards and tackboards shall be the products of one manufacturer. Take field measurements prior to preparation of shop drawings and fabrication to ensure proper fitting. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay.
- c. All board surfaces shall be premium quality with a hardness test result of not less than 6.0 on Moh's Hardness Scale.
- d. Provide samples of each product for initial selection of colors, patterns, and textures, as required, and for verification of compliance with requirements indicated. Sample panels approximately 4 inches by 6 inches for each type of markerboard and tackboard indicated. Include a sample panel for each color, texture, and pattern required.
- e. Furnish a written guarantee to the Owner stating that all porcelain enamel markerboards installed in accordance with manufacturer's directions, which under normal classroom usage and maintenance do not retain the original writing and erasing qualities for 50 years after date of substantial completion or for the life of the building, will be replaced and installed without charge to the Owner.
- f. Markerboards, tackboards, tackstrips shall be manufactured by Claridge Products and Equipment, Inc., GBC, or approved equal.
- g. Multi-media Markerboard: Trim and metal framing shall be Claridge Type "E" Series 3 (L and R) GreenSteel AX Series or approved equal.
 - 1) Writing surface shall be uniform standard manufacturer's color and a uniform surface texture. Provide not less than 6 manufacturer's standard colors for face sheet complying with a reflections factor of not more than 20% or less than 15%. Reflections factor shall be guaranteed not to vary as a result of wear and use.

- 2) Base metal shall be special quality "Enameling Iron or Steel" of low metalloid and copper content, especially manufactured and processed for temperatures over 1400 degrees used in coating porcelain on steel units for Architectural purposes and shall be of minimum 22 gauge.
 - 3) Board surfaces shall consist of the following:
 - A. A custom ground primer coat of .0025" minimum thickness.
 - B. A vitreous-porcelain writing surface coating of .0025" minimum thickness.
 - C. The reverse side of the steel base sheet shall receive a ground coat of .0005" and a spray coat of silica for better lamination adhesion.
 - D. The panel edges at butt joints shall be porcelain enamel.
 - E. Fuse cover and ground coats to the steel at the manufacturer's standard firing temperature, but not less than 1250 degrees F.
 - 4) The dry markerboard surfaced steel shall be factory laminated to 7/16" thick fiberboard core. A moisture blocking backing sheet shall be provided.
 - 5) Lamination: The surface facing and the backing shall be coned to the core material by means of a special flexible adhesive developed for this purpose with nonbonded area. The face and back shall not be removable without rupturing the core material nor shall the panel delaminate under normal school room use.
 - 6) Joints: Where vertical joints occur, a fourteen (14) gauge continuous concealed steel spline shall be fitted tightly into grooves in the core material. All abutting to be done at the factory so as to give a smooth butt joint. Exposed metal joint covers will not be acceptable.
- h. Tackboard: Trim and metal framing shall be Claridge Series 3 or approved equal.
- 1) All bulletin and tackboards indicated on plans shall be 1/4" thick. Provide seamless sheet, 1/4 inch thick ground natural cork compressed with a resinous binder with washable vinyl finish and integral color throughout, laminated to burlap backing. Provide color and texture as scheduled or as selected from the manufacturer's standards.
 - 2) All tackboards shall be 12" high unless indicated otherwise on drawings.
 - 3) Cork shall be factory cemented to 1/4" masonite quarterboard for factory framing.
 - 4) Provide endcaps at each end of the tackstrips.
- i. Furnish and install Type E" (left and right), Series 3 Aluminum trimmed pre-fab boards as per specifications and details including chalktray, trim, map and display rails, end finish in

extruded shapes of approved design and thickness. Provide one end stop at each end of the map and display rails.

- 1) All exposed aluminum trim shall be No. 6063-T5 anodized satin aluminum finish in extruded shapes of approved design and thickness.
 - 2) Provide combination paper clip and map hook, minimum of two per board and maximum of 4'-0" center to center for longer boards.
 - 3) Chalk/Marker Trough: Extruded aluminum, 0.092 inch thick, not less than 3-inch projection from writing surface with grooved top surface, closed ends and return to wall surface at underside. Design to be snap-on type with concealed fasteners.
- j. Inspect surfaces and related construction to receive units. Partitions shall have reinforcing to receive fasteners. Verify type and placement of reinforcement. Do not proceed with the installation until reinforcement is in place and surfaces are flat.
- k. Markerboards
- 1) Install units in locations and at mounting heights indicated and in accordance with the manufacturer's instructions. Keep perimeter lines straight, plumb, and level. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for a complete installation.
 - 2) Verify that accessories required for each unit have been properly installed and that operating units function properly. Clean units in accordance with the manufacturer's instructions.

1080 BATHROOM ACCESSORIES

- a. Furnish and install in restroom space 121-B toilet paper dispensers (one per W.C.): Stainless steel surface mounted B-2888 by Bobrick or approved equal.
- b. Stainless steel angle frame mirrors with shelf B-290 by Bobrick or approved equal (see plans for number required).

1081 GRAB BARS

- a. Furnish and install grab bars where shown on drawings.
- b. Grab bars shall be installed as required by the Standard Building Code, ANSI A117.1 - 1998 Edition and the American With Disabilities Act of 1991.

- c. Bars shall be concealed mounting type B-6806 series (length as required by ANSI A117.1 - 1998 Edition) as manufactured by Bobrick or approved equal. Bars shall be 1-1/2" diameter with peened non-slip gripping surface and satin finish flange and grab bar in stainless steel.

END OF DIVISION TEN

SECTION 15000

GENERAL PROVISIONS

PART 1 GENERAL

1.01 WORK INCLUDED:

- A. The General Conditions, Special Conditions, and Supplementary Conditions of the specifications are binding on this division of the work.
- B. The drawings and specifications are complementary to each other and what is called for by either shall be as binding as if called for by both.
- C. The Contractor shall provide qualified supervision, skilled labor, quality material, machinery, plant, and any other items necessary to install a complete, functional, safe, quiet, operating mechanical system.
- D. Prior to bidding the work, the Contractor shall examine all sections of the specifications and the complete set of contract drawings and bring to the attention of the Architect and Engineer any omission, conflicts, or concerns effecting this Division of the work.
- E. The work of this Division consists essentially of but shall not be construed as limited to:
 - 1. Plumbing System.
 - 2. Heating, Ventilating and Air Conditioning System (HVAC).

1.02 CODES, STANDARDS, PERMITS, FEES, APPLICABLE STANDARDS:

- A. The Contractor shall comply with the latest edition of the regulations of the National Electrical Code, the NFPA 13, 14, 20, 24, 90a, 90b, the International Building Code, the International Fire Code, the International Plumbing Code, the International Fuel Gas Code, and the International Mechanical Code in the performance of the work.
- B. The Contractor shall comply with ASHRAE Guides, S.M.A.C.N.A. Guides, and all local codes, municipal, state, and Federal laws applicable to the work.
- C. The Contractor shall provide all required notices, obtain all required permits, pay all required fees, and comply with local inspection requirements. Deliver to the Architect permits, licenses, and certificates of test. Contractor shall obtain Certificates from local and state health departments approving complete water and sanitary systems where applicable, and certificates from local fire department or state deputy fire marshal approving the fire protection system and equipment.
- D. Compliance: When materials or equipment must conform to the standards of organizations such as the American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), American Society of Mechanical Engineers (ASME), National Electric Manufacturers Association (NEMA), and Underwriters

Laboratories (UL), proof of such conformance shall be submitted to the Engineer for review. If an organization uses a label or listing to indicate compliance with a particular standard, the label or listing will be acceptable evidence, unless otherwise specified.

- E. Construction Standards and/or Codes: The latest editions of standards and/or codes referenced, with all amendments as of the date of the opening of bids, shall govern the installation of all work and are adopted and incorporated into the contract documents and made a part thereof by reference, provided, however, that the drawings and specifications are adhered to in all cases where they call for quality of materials, quality of workmanship, or quality required by such standards and/or codes, and provided also that there may be no variances from the plans and specifications except to the extent that the said variance shall be necessary in order to comply with such standards and/or codes. It shall be the responsibility of the Contractor to familiarize himself with the requirements of such standards and/or codes. If there are any express requirements in the plans or specifications which are at variance therewith, all changes in the work necessary to eliminate the said requirements and make the work conform to standards and/or codes shall be accomplished in the manner provided in the contract for changes in the work.
- F. During construction and at the completion of the work, the Contractor shall perform tests as specified and perform any additional tests that the Engineer may consider to be necessary. If test results determine that parts of the work are defective or do not comply with the specifications, such changes to the work, as are necessary, shall be made to put the work in condition to comply. Such work and required additional testing cost shall be at the Contractors expense; no cost to the Owner.
- G. The following requirements are supplementary to the test specified for individual equipment and/or systems in this section of the specifications:
 - 1. Concealed or insulated work shall remain uncovered until required test have been completed, but in the event that the project construction requires it, the Contractor shall arrange for test on portions of the work as the project schedule progresses.
 - 2. The Architect shall be notified in advance of all tests and shall be represented at such test. The cost of labor, material, instruments, etc. required for testing shall be borne by the Contractor, unless otherwise specified.
 - 3. Acceptance test for operation and performance as specified and/or required for all equipment and systems shall be in the presence of the Architect, an Owner's representative, as well as representatives of local authorities having jurisdiction. Documentation of the test and test results shall be provided to the Architect.

1.03 DRAWINGS:

- A. Project drawings accompanying the specification are generally diagrammatic and do not show all details of bolts, nuts, connections, fittings, offsets, and the like required for the complete system and do not indicate the exact location of piping, fixtures, equipment, etc., unless dimensioned or noted. While these drawings shall be followed as closely as possible, all dimensions shall be confirmed in the field and any necessary changes shall be made in accordance with structural and architectural conditions, the equipment to be

installed, or with the work of other trades prior to installation, and without any additional cost to the Owner/Architect/Engineer. The drawings and specifications are complimentary to each other and what is called for by one shall be as binding as if called for by both. Any component item under this contract shall be furnished and installed by the Contractor without any additional cost to the Owner/Architect/Engineer.

1.04 EXAMINATION OF CONDITIONS:

- A. The Contractor agrees, by submitting his bid, that he is satisfied by his careful examination as to the nature and location of the work; the condition of the grounds, building, etc.; the character, quality, and quantity of the materials to be encountered; the general and local conditions; and all other matters which can affect the work under this contract.
- B. For renovation/addition/retrofit type work, the Contractor shall visit the site to gain a full understanding of the scope of work.

1.05 COORDINATION:

- A. Coordinate work with other trades to avoid interference and establish necessary space requirements and tie-ins for each trade.
- B. Prior to starting installation, furnish to the General Contractor or Construction Manager copies of the “reviewed” project shop drawings showing location of piping, equipment, components, etc.
- C. Schedule periodic meetings with other trade prior to and during installation so as to avoid conflicts and assure that pipes, conduits, equipment, etc. are installed in the best manner, taking into consideration head-room, maintenance, service, replacement, and appearance.

END OF SECTION

SECTION 15015

SEISMIC PROTECTION FOR MECHANICAL PIPING AND EQUIPMENT

PART 1 GENERAL

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

1.01 GENERAL:

- A. The contractor shall install all mechanical equipment in accordance with the design detail provided by a seismic engineer. The engineer shall be registered, shall be experienced in the design of site-specific seismic protection of mechanical equipment and piping and shall be employed by and responsible to the appropriate mechanical (HVAC or plumbing) sub-contractor.

END OF SECTION

SECTION 15030

START-UP OF MECHANICAL SYSTEMS

PART 1 GENERAL

1.01 ADJUSTMENTS AND TESTS:

- A. All piping systems for which specific tests have not been specified shall be tested hydrostatically, or by other procedure mutually agreed upon and approved, and proved mechanically sound and free from leaks. Test pressure for such tests shall be 150% of the design working pressure of the line, but in no case less than 125 psig.
- B. Balance all water circulating systems so that quantities circulated will be as specified.
- C. Adjust and balance all duct systems so that air quantities at all inlets and outlets are as indicated and so that air distribution over entire cross sectional areas of conditioned spaces are draft free.
- D. Permanently mark all dampers and adjusting devices so that they can be restored if disturbed at any time.
- E. Adjust all equipment to perform as specified and as required to give satisfactory results.
- F. Upon completion of construction and testing, properly clean all cleanable type filters and leave in as new condition. Replace all throwaway filters with new, previously unpackaged filters.
- G. Contractor shall provide all instruments and facilities for performing all required tests in an approved manner.

1.02 INSTRUCTIONS:

- A. Provide and mount on the equipment or storage room wall a suitable #16 gauge metal cabinet with hinged cover and push button latch. Cabinet shall be designed for permanent storage of one (1) complete set of all required installation, operating and maintenance instructions which shall be enclosed therein by the Contractor. Cabinet shall be finished with a hammered gray baked-on enamel.

END OF SECTION

SECTION 15035

VIBRATION AND NOISE CONTROL

PART 1 GENERAL

1.01 SCOPE:

- A. Unless otherwise specified or noted on drawings, all mechanical equipment shall be mounted on vibration isolators to prevent the transmission of vibration and mechanically transmitted sound to the building structure. Vibration isolators shall be selected in accordance with the weight distribution so as to produce reasonably uniform deflection. Deflections shall be as noted on drawings or as specified hereinafter.

1.02 MANUFACTURER:

- A. Vibration and noise control equipment specified hereinafter shall be as manufactured by Mason Industries, Inc. Equal products of Korfund, Peabody or Vibration Mountings & Controls will be acceptable.

PART 2 PRODUCTS

2.01 VIBRATION MOUNTINGS:

- A. Type A: Double deflection neoprene mountings shall have a minimum static deflection of 0.35". All metal surfaces shall be neoprene covered to avoid corrosion and have friction pads both top and bottom so they need not be bolted to the floor. Bolt holes shall be provided for these areas where bolting is required. On equipment such as small vent sets and close coupled pumps, steel rails shall be used above the mountings to compensate for the overhang. Mountings shall be Type ND or rails Type DNR as manufactured by Mason Industries, Inc.
- B. Type B: Spring type isolators shall be free-standing and laterally stable without any housing and complete with 1/4" neoprene acoustical friction pads between the baseplate and the support. All mountings shall have leveling bolts that must be rigidly bolted to the equipment. Spring diameters shall be no less than 0.8" of the compressed height of the spring at rated load. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Submittals shall include spring diameters, deflections, compressed spring height and solid spring height. Mountings shall be Type SLF as manufactured by Mason Industries, Inc.
- C. Type C: Equipment with operating weight different from the installed weight, such as chillers, boilers, etc., and equipment exposed to the wind, such as cooling towers, shall be mounted on spring mountings as described for Type B, but a housing shall be used that includes vertical limit stops to prevent spring extension when weight is removed. The housing shall serve as blocking during erection, and cooling tower mounts shall be located between the supporting steel and roof or the grillage and dunnage as shown on the drawings. The installed and operating heights shall be the same. A minimum

clearance of 1/2" shall be maintained around restraining bolts and between the housing and spring so as not to interfere with the spring action. Limit stops shall be out of contact during normal operations. Mountings used out-of-doors shall be hot dipped galvanized. Mountings shall be Type SLR as manufactured by Mason Industries, Inc.

2.02 VIBRATION HANGERS:

- A. Type D: Vibration hangers shall contain a steel spring and 0.3" deflection neoprene element in series. The neoprene element shall be molded with a rod isolation bushing that passes through the hanger box. Spring diameters and hanger box lower hole sizes shall be large enough to permit the hanger rod to swing through a 30 degree arc before contacting the hole and short circuiting the spring. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Submittals shall include a scale drawing of the hanger showing the 30 degree capability. Hangers shall be Type 30N as manufactured by Mason Industries, Inc.
- B. Type E: Vibration hangers shall be as described for Type D, but they shall be precompressed to the rated deflection so as to keep the piping or equipment at a fixed elevation during installation. The hangers shall be designed with a release mechanism to free the spring after the installation is complete and the hanger is subjected to its full load. Deflection shall be clearly indicated by means of a scale. Submittals shall include a scale drawing of the hanger showing the 30 degree capability. Hangers shall be Type PC30N as manufactured by Mason Industries, Inc.,.
- C. Type F: Vibration hangers shall contain a steel spring located in a neoprene cup manufactured with a grommet to prevent short circuiting of the hanger rod. The cup shall contain a steel washer designed to properly distribute the load on the neoprene and prevent its extrusion. Spring diameters and hanger box lower hole sizes shall be large enough to permit the hanger rod to swing through a 20 degree arc before contacting the hole and short circuiting the spring. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Hangers shall be provided with an eye bolt on the spring end and provision to attach the housing to the flat iron duct straps. Submittals shall include a scale drawing of the hanger showing the 30 degree capability. Hangers shall be Type W30 as manufactured by Mason Industries, Inc.

2.03 HORIZONTAL THRUST RESTRAINTS:

- A. Type X: Where indicated, handling equipment shall be protected against excessive displacement which might result from high air thrusts in relation to the equipment weight. The horizontal thrust restraint shall consist of a spring element in series with a neoprene pad as described in Specification B with the same deflection as specified for the mountings or hangers. The spring element shall be contained within a steel frame and designed so it can be preset for thrust at the factory and adjusted in the field to allow for a maximum of 1/4" movement at start and stop. The assembly shall be furnished with one rod and angle bracket for attachment to both the equipment and ductwork or the equipment and the structure. Horizontal restraints shall be attached at the centerline of thrust and symmetrically on either side of the unit. Horizontal thrust restraints shall be Type WB as manufactured by Mason Industries, Inc.

2.04 BASES:

- A. Type G: Vibration isolator manufacturer shall furnish integral structural steel bases. Bases shall be rectangular in shape for all equipment other than centrifugal refrigeration machines and pump bases which may be 'T' or 'L' shaped. Pump bases for split case pumps shall include supports for suction and discharge base ells. All perimeter members shall be beams with a minimum depth equal to 1/10th of the longest dimension of the base. Beam depth need not exceed 14" provided that the deflection and misalignment is kept within acceptable limits as determined by the manufacturer. Height saving brackets shall be employed in all mounting locations to provide a base clearance of 1". Bases shall be Type WF as manufactured by Mason Industries, Inc.
- B. Type H: Vibration isolator manufacturer shall provide steel members welded to height-saving brackets to cradle machines having legs or bases that do not require a complete supplementary base. Members shall be sufficiently rigid to prevent strains in the equipment. Inverted saddles shall be Type ICS as manufactured by Mason Industries, Inc.
- C. Type J: Vibration isolator manufacturer shall furnish rectangular structural beam or channel concrete forms for floating foundations. Bases for split case pumps shall be large enough to provide support for suction and discharge base ells. The base depth need not exceed 12" unless specifically recommended by the base manufacturer for mass or rigidity. In general, bases shall be a minimum of 1/12th of the longest dimension of the base, but not less than 6". Forms shall include minimum concrete reinforcement consisting of 1/2" bars or angles welded in place on 6" centers running both ways in a layer 1-1/2" above the bottom, or additional steel as is required by the structural conditions. Forms shall be furnished with steel members to hold anchor-bolt sleeves when the anchor bolts fall in concrete locations. Height saving brackets shall be employed in all mounting locations to maintain a 1" clearance below the base. Bases shall be Type K as manufactured by Mason Industries, Inc.

2.05 CURB-MOUNTED BASES:

- A. Type Y: Where indicated, curb-mounted rooftop equipment shall be mounted on vibration isolation bases that fit over the roof curb and under the isolated equipment. The extruded aluminum top member shall overlap the bottom member to provide water runoff independent of the seal. The aluminum members shall house cadmium plated springs having a 1" minimum deflection with 50% additional travel to solid. Spring diameters shall be no less than 0.8" of the spring height at rated load. Wind resistance shall be provided by means of resilient snubbers in the corners with a minimum clearance of 1/4" so as not to interfere with the spring action except in high winds. The weather seal shall consist of continuous closed cell sponge materials both above and below the base and a waterproof flexible ductlike EPDM connection joining the outside perimeter of the aluminum members. Foam or other contact seals are unacceptable at the spring cavity closure. Caulking shall be kept to a minimum. Submittals shall include spring deflections, spring diameters, compressed spring height and solid spring height as well as seal and wind resistance details. Curb-mounted bases shall be Type CMAB as manufactured by Mason Industries, Inc.

B. Type Z:

1. Where indicated, curb-mounted rooftop equipment shall be mounted on vibration isolation bases that fit over the roof curb and under the isolated equipment. The extruded aluminum top and bottom members shall contain cadmium plated springs having a 1" minimum deflection with 50% additional travel to solid. Spring diameters shall be no less than 0.8" of the spring height at rated load. Springs shall be located at maximum intervals of 2' and shall be so selected that the total force of all the springs in the base system amounts to no more than 20% of the total weight of the mounted unit. Wind resistance shall be provided by means of resilient snubbers in the corners with a minimum clearance of 1/4" so as not to interfere with the spring action except in high winds.
2. The weather seal shall consist of continuous closed cell sponge materials both above and below the base and a waterproof flexible ductlike neoprene connection joining the outside perimeter of the aluminum members. Foam or other contact seals are unacceptable at the spring cavity closure.
3. Eighty percent (80%) of the weight of the equipment shall be taken by four (4) springs having a minimum deflection of 3-1/2" that are seated on steel bridging members that pass over the top of the unit. These springs shall be used in series with neoprene pads and shall have all the characteristics of the springs described above except that they shall be hot-dipped galvanized rather than cadmium plated. Attachment to the unit shall be by means of 1" threaded rods attached to the unit's lifting lugs by means of clevises. The cross members shall be supported by four (4) columns, which in turn are resting on load distributing beams that run the length of the roof curb on either side of the unit. The beams shall be cemented to continuous 1/4" thick waffle neoprene pads so as not to cut the roof membrane.
4. Submittals shall include all spring deflections, spring diameters, compressed spring height and solid spring height as well as seal and wind resistance details. The sealing curb shall be Type CMAB and the 3-1/2" deflection springs Type IM, all as manufactured by Mason Industries, Inc. The vibration vendor shall furnish the steel structure with calculations showing that the roof supported beams will reflect no more than 1/360th of the span if supported at the ends as simple members with similar maximum deflection limitations for the upper bridging members. All structural steel members shall be primed with red lead paint prior to shipment.

2.06 FLEXIBLE PIPE CONNECTIONS:

A. Type K:

1. Flexible neoprene connectors shall be provided on equipment as indicated or specified. They shall be manufactured of multiple plies of nylon tire cord fabric and neoprene both molded and cured in hydraulic rubber presses. No steel wire or rings shall be used as pressure reinforcement. Straight connectors shall have two spheres. Connectors up to and including 1-1/2" diameter may have threaded ends. Connectors 2" and larger shall be manufactured with floating galvanized

flanges recessed to lock the connector's raised face neoprene flanges. Hoses shall be installed on the equipment side of the shutoff valves.

2. Connectors shall be rated a minimum of 150 psi at 220°F. Flanged equipment shall be directly connected to neoprene elbows in the size range 2-1/2" through 12" if the piping makes a 90 degree turn at the equipment. All straight-through connections shall be made with twin-spheres properly pre-extended as recommended by the manufacturer to prevent additional elongation under pressure. 12" and larger sizes operating above 100 psi shall employ control cables with end fittings isolated by means of 1/2" thick bridge bearing neoprene washer bushings designed for a maximum of 100 psi.
 3. Submittals shall include two test reports by independent consultants showing minimum reductions of 20 db in vibration accelerations and 10 db in sound pressure levels at typical blade passage frequencies.
 4. Elbows shall be Mason-Flex Type MFNEC, straight connectors Mason-Flex Type MFTFU or MFTNC, and control cable assemblies Type ACC, all as manufactured by Mason Industries, Inc.
- B. Type L: Flexible stainless steel hoses shall be provided where indicated or specified.
1. Hoses shall have stainless steel braid and carbon steel fittings. Sizes 3" and larger shall be flanged. Smaller sizes shall have male nipples. Lengths shall be as tabulated:

| Flanged | | Male Nipples | |
|---------|---------|--------------|------------|
| 3 x 14 | 10 x 26 | 1/2 x 9 | 1-1/2 x 13 |
| 4 x 15 | 12 x 28 | 3/4 x 10 | 2 x 14 |
| 5 x 19 | 14 x 30 | 1 x 11 | 2-1/2 x 18 |
| 6 x 20 | 16 x 32 | 1-1/4 x 12 | |
| 8 x 22 | | | |

2. Hoses shall be installed on the equipment side of the shutoff valves horizontally and parallel to the equipment shafts wherever possible. Hoses shall be Type BSS as manufactured by Mason Industries, Inc.

PART 3 EXECUTION

3.01 INSTALLATION:

- A. All noise and vibration control equipment shall be installed in strict accordance with manufacturer's recommendations and instructions.

END OF SECTION

SECTION 15040

PLUMBING DEMOLITION AND REMOVAL

PART 1 GENERAL

1.01 WORK INCLUDED:

- A. The work includes removal of existing plumbing fixtures, equipment, DWV and water piping, insulation, hangers, etc. as indicated, noted or specified on the drawings. Do not begin demolition until authorization is received from the General Contractor/Architect. Remove material and debris from the job site daily, unless otherwise directed; do not allow accumulations inside or outside the building. Store materials that cannot be removed daily in areas specified by the General Contractor/Architect. Material for Owners salvage shall be delivered to location defined by the General Contractor/Architect. All other material shall be properly disposed of off-site. Dispose of debris, rubbish, scrap, and other non-salvageable materials resulting from removal operations with all applicable federal, state and local regulations.

1.02 DUST CONTROL:

- A. Take appropriate action to check the spread of dust to occupied portions of the building and to avoid the creation of a nuisance in the surrounding area. Do not use water if it results in hazardous or objectionable conditions, such as ice, flooding or pollution. Comply with all dust regulations imposed by all applicable federal, state and local air pollution agencies.

1.03 PROTECTION:

- A. Protect existing work (material, equipment, etc.); which is to remain in place, to be reused, or to remain the property of the Owner, by temporary covers, shoring, bracing, and supports. Items which are to remain or salvaged and are damaged during the performance of work shall be repaired to their original condition or replaced with new. Do not overload structural elements. Provide new supports and reinforcement for existing construction weakened by demolition or removal work.

1.04 BURNING/BURY:

- A. Burning of trash and debris will not be permitted. Nothing shall be buried on-site.

PART 2 EXECUTION

2.01 UTILITY SERVICES (SEWER, GAS, AND WATER):

- A. Disconnections or interruption of utility services shall be approved by the General Contractor/Architect. Provide 24 hour notice to General Contractor prior to any interruption of service.

2.02 TITLE TO MATERIALS:

- A. Except where indicated otherwise or specifically specified otherwise in other sections, all plumbing fixtures and equipment removed shall become the property of the Owner and shall be properly stored. Title to all piping resulting from demolition shall be retained by the Plumbing Contractor.

2.03 PATCHING:

- A. Wherever existing surfaces are damaged during performance of the work, including openings and unfinished areas resulting from the removal of materials or equipment, the repair, patch, and finish such surfaces to match adjacent undamaged surfaces will be performed by the General Contractor.
- B. Saw cutting and removal of existing floor slabs or block walls shall be approved by the general contractor and performed by the Plumbing Contractor. Trenching, pipe installation, testing, backfilling and compaction shall be by the Plumbing Contractor. Replacement of floor concrete and finish materials as well as “toothing” block into walls shall be by the General Contractor.

2.04 CLEANUP:

- A. Debris and Rubbish: Remove and transport debris, rubbish, and any excess soil in a manner that will prevent spillage on streets or adjacent areas. Any spillage into the streets and adjacent areas shall be cleaned up.
- B. Regulations: Comply with federal, state, and local hauling and disposal regulations.

END OF SECTION

SECTION 15100

PIPE IDENTIFICATION

PART 1 GENERAL

1.01 WORK INCLUDED:

- A. The work includes all labor, materials, equipment, and plant required for complete installation of identification markers and flow arrows on the following pipe systems.

1.02 INSTALLATION:

- A. Pipe identification markers and flow arrows shall be install on pipe work after all insulation is complete and prior to installation of ceiling grid. Work may be performed by the Contractor's own forces, the Insulation Sub-Contractor or other qualified specialty sub-contractor.

1.03 SYSTEMS:

| PIPING SYSTEM: | BACKGROUND COLOR: | MARKER COLOR: |
|---------------------------|-------------------|---------------|
| Domestic Cold Water | Green | White |
| Domestic Hot Water Supply | Yellow | Black |
| Domestic Hot Water Return | Yellow | Black |
| Fire Sprinkler Piping | Red | White |
| Gas, Natural | Yellow | Black |
| Sanitary Sewer | Green | White |
| Sanitary Vents | Yellow | Black |
| Chilled Water Supply | Green | White |
| Chilled Water Return | Green | White |
| Hot Water Supply | Yellow | Black |
| Hot Water Return | Yellow | Black |
| Roof Drainage | Green | White |
| Compressed Air Piping | Yellow | Black |

1.04 STANDARDS:

- A. The contractor shall furnish all material in accordance with latest edition of OSHA and ANSI Standard A13.1 applicable provisions.

PART 2 EXECUTION

2.01 SHOP DRAWINGS:

- A. Contractor shall furnish to the Architect shop drawings that show complete details of the marking system including colors and letter sizes.

- B. In accordance with ANSI A13.1 “Scheme for the Identification of Piping System”, each marker shall show:
 - 1. Approved color coded background.
 - 2. Proper legend color in relation to background color.
 - 3. Approved legend height/size.
 - 4. Approved marker length.
- C. Direction of flow arrows shall be included unless otherwise specified.

2.02 MARKING SYSTEM:

- A. All piping that is not built in or exposed in a finished space shall have identification markers and flow arrows installed. Mechanical Equipment rooms, Parking Garages, Stages, Gymnasiums, and other large assembly areas without ceilings shall not be considered finished spaces. Identification shall be required in these locations.
- B. Identification markers shall be semi-rigid plastic or vinyl; not pressure sensitive stick on markers. Pipe markers shall be as follows:
 - 1. Setmark Type SNA markers on pipe 3/4" thru 5", Snap On.
 - 2. Setmark Type STR markers on pipe 6" and larger, Snap On.
 - 3. Setmark outdoor grade plastic acrylic shall be used for identification system.
 - 4. Pipe identification as manufactured by Seton Nameplate Co., New Haven, CT. (1-800-243-66240); Brady Corporation, (1-800-537-8791), or prior approved equal.

2.03 LOCATIONS:

- A. Locate pipe identification markers and flow arrows at each pipe penetration through a wall, floor, or ceiling construction.
- B. Locate pipe identification markers and flow arrows at each pipe penetration to underground.
- C. Locate pipe identification markers on all horizontal pipe runs at 25' intervals.
- D. Locate pipe identification markers at each piece of mechanical equipment, heater, pump, compressor, generator, etc. except on plumbing fixtures.

2.04 TAGS:

- A. For pipe under 3/4", too small for color bands and legends, provide and install brass identification tags 1-1/2" in diameter with 3/8" black filled.

- B. Install tags at same locations as noted above. Attach with nylon snap ties and “S” hooks.

END OF SECTION

SECTION 15120

HANGERS AND SUPPORTS

PART 1 NOT USED

PART 2 PRODUCTS

2.01 MATERIALS AND SPECIALTIES:

- A. Perforated strap, chains, and tie wire shall not be permitted in any form to support, hang, or secure pipe.
- B. Pipe hangers, supports and accessories shall be the standard products of Grinnell Co. , PHD Manufacturing, Michigan Hanger Co., or B-Line Systems or other prior approved manufacturer.
- C. For chilled water, chilled/hot water, or HVAC piping, hangers shall be the equivalent of Auto-Grip "Insul-Speed" zinc electro-plated hanger, ASTM Type L.S. with permanently attached coated shield 12" long x 18 gauge steel. Flexible Aerotube, fiberglass or other low-density insulation shall not be used at insulation shields. A 12" length of Foamglas or other approved high-density insulation with fire resistant vapor barrier shall be used at each insulation shield. Details must be approved prior to installation. Where trapeze hangers are used, use insulation protection devices as above less pipe rings.
- D. For domestic hot, tempered, and cold water piping, roof or overflow piping, and condensate drain lines from air handling equipment where run above ground, hangers shall be oversized galvanized clevis with integral factory installed insulation shield. Hangers shall be spaced not over 6' apart for 1-1/2" and smaller pipes and not over 8' apart for pipes 2" and larger. Insulation shall be continuous through the hangers. Hangers shall be equal to PHD model #455 or Michigan Hanger #403.
- E. For cast iron or other ferrous piping run above ground, hangers shall be galvanized clevis. Hangers shall be spaced not over 5' apart on cast iron and 8' apart on other steel piping. Locate hangers as close as possible to cast iron hubs or bands. Hangers shall be equal to Michigan Hanger Co. #401.
- F. For "plastic" drainage piping systems; PVC, CPVC, Polypropylene, PVDF, or other, run above ground, hangers shall be galvanized V clevis hangers with support trough in 10' lengths. Hangers shall be spaced at each end of support trough, less than 10' oc. Hangers shall be equal to PHD #450 V and trough shall be equal to #450 T.
- G. For "plastic" water or sprinkler piping systems, PVC and CPVC, run above grade, hangers shall be galvanized, hangers shall be spaced a maximum of 4' apart.
- H. Pipe rings for copper tube shall be Fee and Mason Figure 363 or "Auto-Grip" Symbol 19-500A Universal ring (copper plated).

- I. For support of all other overhead horizontal pipes use "Auto-Grip" Symbol 19-400A Universal hanger rings, Grinnell Figure 104 or Figure 260 adjustable clevis ring (on piping 3-1/2" size and over).
- J. Inserts shall be Unistrut Sections or Grinnell Figures 279, 281 or 285 wrought steel with proper size nut.
- K. Beam clamps shall be Grinnell as follows: Figure 131 I-beam clamp, Figure 226 Universal channel clamp or Figure 267 Simplex top beam clamp. Figure 87 C-clamp with locknut and retaining clip may be used within its recommended maximum load rating.
- L. Specially designed hangers and/or supports shall be provided as detailed on the drawings and/or complying with the requirements of Sections 15130 through 15190.
- M. All hangers, supports, hanger rods and accessories shall be Zinc-plated and/or Hot-Dip Galvanized unless otherwise specified.
- N. All exposed hangers, supports, hanger rods and accessories exposed to salt air (defined as within one [1] mile of ocean/inlet shoreline) shall be type 316 stainless steel unless otherwise specified.

PART 3 EXECUTION

3.01 INSTALLATION:

- A. Generally, horizontal overhead runs of piping shall be hung with adjustable, wrought iron or malleable-iron pipe hangers. Chain strap, perforated bar or wire hangers will not be permitted. Hanger rings shall be copper or copper plated when in contact with copper pipe.
- B. Trapeze hangers constructed of angle or channel iron sections may be used in lieu of individual hanger rings where multiple pipes run parallel at the same elevation and grade. Details must be submitted for approval.
- C. Pipe clips, straps and hooks may be used where approved for the service, and shall be copper or copper plated when in contact with copper pipe.
- D. The exterior wall of the building shall not be pierced by hanger and/or support bolts.
- E. Supplementary steel supports shall be provided for proper support of piping and/or equipment which cannot be supported directly from the building structure.
- F. Inserts and bolts for supporting piping and/or equipment shall be placed in concrete or masonry areas before concrete is poured and as masonry is built. Where multiple pipes run parallel, approved Unistrut Channel sections may be used in lieu of individual inserts. Inserts and/or unistrut sections shall not be used in pre-cast concrete or in concrete less than 3-1/2" in thickness.

- G. Beam clamps shall be used insofar as possible where piping and/or equipment is supported from building structural steel. Punching of building structural steel will not be permitted. Support brackets electric welded to the building steel will be considered in lieu of beam clamps. Details must receive prior approval of the Engineer.
- H. Supporting brackets and hangers in plastered, painted or tiled areas shall be installed before such areas are plastered, painted or tiled.
- I. Hanger rods penetrating finished ceilings shall be provided with the equivalent of Grinnell Figure 133 spring ceiling plates.
- J. Spacing of piping hangers and/or supports shall conform to the following unless otherwise specified, detailed or approved:
 - 1. Steel pipe: 10'-0" maximum.
 - 2. Hard drawn copper pipe: 1-1/2" and smaller - 6'-0" maximum; 2" and up - 8'-0" maximum.
 - 3. Soft copper tubing: 5'-0" maximum.
 - 4. Cast iron pipe: at or near each hub or band.
 - 5. Underground cast iron and tile: body of pipe firmly bedded on solid ground.
 - 6. Soil, waste, drain, and vent stacks: permanent support at base. Provide "riser" clamps at each floor, and at 10' intervals if floor height exceeds 14'.
 - 7. Generally: Provide additional hangers where a number of valves, fittings, etc., are assembled and at least one hanger not more than 2' from where a change in direction takes place in any pipe line.
- K. Anchors shall be provided to confine expansion movements of pipes to definite expansion members.
- L. Specially designed hangers and/or supports shall be provided for any unusual conditions of installation. All specially designed hangers and/or supports must receive approval prior to fabrication and installation.

END OF SECTION

SECTION 15210

PLUMBING PIPING INSULATION

PART 1 GENERAL

1.01 WORK INCLUDED:

- A. Work included in this section shall be the insulation of hot, tempered, return, cold water piping, condensate drains, all drainage piping that may be subject to condensation (including icemaker drainage and electric water coolers), roof drains, and storm drain piping above grade.
- B. Insulation shall be applied by factory-trained personnel of a Sub-contractor specializing in insulation installation.

1.02 DELIVERY AND STORAGE OF MATERIALS:

- A. All of the insulation materials and accessories covered by this specification shall be delivered to the job site and stored in a safe, dry place with appropriate labels and/or other product identification.
- B. The contractor shall use whatever means are necessary to protect the insulation materials and accessories before, during, and after installation. No insulation material shall be installed that has become damaged in any way. The contractor shall also use all means necessary to protect work and materials installed by other trades.
- C. If any insulation material has become wet because of transit or job site exposure to moisture or water, the contractor shall not install such material, and shall remove it from the job site. An exception may be allowed in cases where the contractor is able to demonstrate that wet insulation when fully dried out (either before installation or afterward following exposure to system operating temperatures) will provide installed performance that is equivalent in all respects to new, completely dry insulation. In such cases, consult the insulation manufacturer for technical assistance.

PART 2 PRODUCTS

2.01 HAZARD CLASSIFICATION:

- A. Fire hazard classification for all material shall not exceed flame spread of 25 and smoke development of 50, as listed by UL and acceptable under NFPA standards. This is to apply to the complete system and to the composite insulation with jacket or facings, vapor barrier, joint sealing tapes, mastic and fittings.

2.02 PIPE INSULATION:

- A. Material shall be heavy density molded fiberglass with a factory applied all-service jacket composed of an outer layer of fiberglass scrim cloth, aluminum foil, and white kraft paper.
- B. Material for any water or storm drain piping, inside a block wall, shall be Armstrong #AP Armaflex self sealing ½" thick closed cell elastomeric insulation on pipe up to 6" in diameter. For larger diameter pipe use ½" thick closed cell flexible elastomeric block sheet material insulation.
- C. Material for below ground hot water, tempered water, and hot water recirculating lines and fittings shall be 1-1/2" thick Pittsburgh Corning Foamglass. Finish with Foster 60-25 cut black asphalt. Reinforced with glass or nylon open weave cloth.

PART 3 EXECUTION

3.01 PIPING:

- A. All fiberglass pipe covering shall be furnished with self-seal lap and 3-inch wide butt joint strips. The release paper is pulled from adhesive edge, pipe covering closed tightly around pipe and self-seal lap rubbed hard in place with the blunt edge of an insulation knife. This procedure applies to longitudinal as well as circumferential joints. Care shall be taken to keep jacket clean, as it is the finish on all exposed work. All adjoining insulation sections shall be firmly butted together before joint strip is applied, and all cold water service lines shall have vapor seal mastic thoroughly coated to pipe at butt joints and at all fittings. All fittings, valve boxes, unions, and flanges shall be finished as follows:
 - 1. Apply molded or segmental insulation to fittings equal in thickness to the insulation on adjoining pipe and wire in place with two (2) #14 copper wires or stainless steel bands.
 - 2. Apply a skim coat of insulating cement to the insulated fitting to produce a smooth surface. After cement is dry, apply Owens-Corning Fiberglass fitting mastic, Type C, UL labeled.
 - 3. Wrap the fitting with fiberglass reinforcing cloth overlapping the preceding layer by 1" to 2".
 - 4. Apply a second coat of mastic over cloth working it well into mesh of cloth and smooth the surface. Mastic to be applied at the rate of 40 square feet per gallon.
 - 5. The Contractor, at his option, may provide molded PVC fitting covers, secured with stainless steel tack fasteners, fiberglass blanket insulation with joints sealed with pressure sensitive tape.
 - 6. Manufacturer's written instructions shall be strictly adhered to for work in this section.

7. Insulation shall be as manufactured by CertainTeed, Owens-Corning or Johns-Manville.
- B. Insulation shall only be applied to piping after pressure testing is completed. All overspray of building fireproofing shall be cleaned from pipe prior to start on insulation.
 - C. Insulation shall be installed continuously through sleeves in masonry and/or fire rated walls.
 - D. All piping shall be supported in such a manner that neither the insulation nor the vapor/weather barrier is compromised by the hanger or the effects of the hanger. In all cases, hanger spacing shall be such that the circumferential joint may be made outside the hanger.
 - E. All "P" traps exposed to freezing conditions shall be insulated with molded PVC fitting covers, secured with stainless steel tack fasteners, 1-inch fiberglass blanket insulation with joints sealed with pressure sensitive tape.
 - F. Piping located outdoors and exposed to the weather or exposed in gymnasiums shall be insulated as indicated. Joints shall be applied to shed water and shall be sealed completely. The insulation shall then be protected with one of the following weatherproof finishes as indicated on contract drawings:
 1. Aluminum Jacket: ASTM B209, 3003 Aluminum Alloy, H-14 temper, 0.016" crimped or smooth aluminum jacket with longitudinal "Z"-joint and 2" wide preformed butt straps with weatherproof flexible elastomer-based permanently plastic sealant (designed as vapor barrier) to seal metal joints; as manufactured by RPR Products, Inc. Provide ¾" wide 0.007" thick aluminum bands; Childers Z-lock or approved equal. Fitting cover: factory-molded 0.025" aluminum, split type, held in place with aluminum bands; RPR Products, Inc. or approved equal.
 2. Stainless-Steel Jacket: ASTM A167, Type 304 or 316, 0.010" thick, No. 2B finish, and factory cut and rolled to indicated sizes; kept in place with ¾" wide Type 304 0.02" thick stainless steel bands.
 3. (Rooftop piping or exposed "P" traps only) PVC Jacketing: High-impact, ultra-violet-resistant PVC, 20-mils thick, roll stock ready for shop or field cutting and forming to indicated sizes; Proto, Zeston, or equal. Use adhesive as recommended by insulation manufacturer.

3.02 INSULATION REQUIREMENTS:

| A. <u>Service</u> | <u>Thickness</u> |
|---------------------------------------|---|
| Cold Water | 1/2-inch with vapor barrier |
| Hot/ Tempered and Recirculating Water | 1-inch with vapor barrier for pipe 2" and smaller 1-1/2" for pipes 2-1/2" and larger |
| Storm Drainage | Sump only - 2" flexible blanket |

Horizontal piping - 1" thick molded
Vertical piping - 1/2" thick molded

Condensate

Horizontal piping - 1/2" thick molded

END OF SECTION

SECTION 15220

DUCT INSULATION

PART 1 GENERAL

1.01 SCOPE:

- A. This specification defines the materials and methods of the duct system insulation. Attention is directed to Section 15200 for General Insulation requirements.

1.02 DEFINITIONS:

- A. "Concealed ductwork" is defined to be that portion of a duct system that is installed within ceiling spaces, building chases or in architecturally furred-in spaces.

PART 2 PRODUCTS

2.01 MATERIALS:

- A. Fiberglass duct insulation (duct wrap) shall be 2-inch thick, 3/4-pound density, flexible blanket type with factory applied vapor barrier in conditioned areas and 3-inch thick (R-8 min), 3/4-pound density, flexible blanket type with factory applied vapor barrier in unconditioned areas. Vapor barrier shall be minimum 0.7 mil thick aluminum foil reinforced with fiberglass yarn mesh and laminated to 40-lb. chemically treated fire resistant Kraft (FRK).
- B. All insulation shall have a composite (insulation, jacket and adhesive used to adhere the jacket to the insulation) fire and smoke hazard rating, as tested by procedure in UL 723 and ASTM E 84, not exceeding:

| | |
|-------------------|----|
| Flame Spread | 25 |
| Smoke Developed | 50 |
| Fuel Contribution | 50 |
- C. Accessories, such as adhesives, mastics, cements and tapes for seams, joints and fittings, shall have the same rating as listed herein.

PART 3 EXECUTION

3.01 INSTALLATION:

- A. All outside air ductwork shall be insulated.
- B. Duct wrap shall be applied with edges tightly butted and secured with outward clinch staples, 2-inches on center. All joints and seams shall be sealed with glassfab and mastic.

On ducts over 24" wide or high, insulation shall be applied over pins welded or cemented to the ducts with all joints sealed with glassfab and mastic. Standing duct braces and other duct projections shall be insulated.

- C. Insulation shall be applied on clean, dry surfaces after inspection, and released for insulation application.
- D. All insulation shall be continuous through wall and ceiling openings and sleeves.
- E. Insulation on all cold surfaces where vapor barrier jackets are used shall be applied with a continuous unbroken vapor seal. Hangers, supports, anchors, or other items that are secured directly to cold surfaces must be insulated and vapor sealed to prevent condensation.
- F. Insulation shall be protected from physical damage at points of support where the insulation must carry the load imposed by the support. Coordinate this requirement with the installation of hangers and supports.

END OF SECTION

SECTION 15400

PLUMBING - GENERAL

PART 1 GENERAL

1.01 WORK INCLUDED:

- A. The General Conditions, Special Conditions, and Supplementary Conditions of the specifications are binding on this Division of the work.
- B. Before the work starts, confirm locations and inverts of existing and proposed pipes, sewers and mains. Review all drawings for project; check grades, elevations, location of structural elements, locations and sizes of chases, type and methods of construction of floors, walls, partitions, etc. Bring to the attention of the Architect and Engineer any unsatisfactory conditions or conflicts between plumbing design in conjunction with the site or other trades. No extra charge/change order will be approved after the start of construction for work resulting from failure to follow these instructions.
- C. Drawings do not indicate all offsets, fittings, and specialties. Examine other drawings, investigate conditions to be encountered, and arrange work accordingly, furnishing additional fittings, valves, specialties, etc., as part of the work. Where conditions necessitate a rearrangement, submit for approval sketches showing a proposed arrangement.
- D. Upon completion of the work, remove trash and debris properly from site, clean and paint unplated metal work and clean fixtures. The work shall be in clean and new condition.
- E. Unless otherwise shown, piping is to be installed concealed, parallel and perpendicular to the building structure at 90° intervals, straight without sags or pockets, and graded for drainage where applicable. Cut pipe ends square and ream; before assembly clean off all dirt, scale and chips. Braze/solder joints according to fittings manufacturer's recommendations. Apply pipe compound to external threads only. Run cold water pipe at least 12 inches away from any source of heat. Make adequate provisions for expansion and contraction of pipes. Protect all piping and equipment during construction. Cover all piping ends to prevent entrance of dirt and debris.
- F. Liability for damages to buildings, contents of buildings, or site property during construction and the guarantee period resulting from workmanship, materials or equipment supplied under this specification is a part of this contract.
- G. The Contractor shall provide all materials and labor to install the plumbing system and shall comply with all local regulations, obtain all permits and pay for all fees. The work shall be in accordance with A.S.P.E. guidelines and conform with the applicable portion of the International Plumbing Code and as required by the local plumbing authority.
- H. Cutting and Repairing: The work shall be carefully laid out in advance, and unnecessary cutting of construction shall be avoided. Damage to building, piping, wiring, or

equipment as a result of cutting shall be repaired by mechanics skilled in the trade involved. Cutting of structural elements shall be approved by the Structural Engineer/Architect prior to cutting.

- I. Submittals for each piping system shall be separated into categories by specification section and for the piping materials and products that each system utilizes as required per Specification Section 15010.
- J. All work shall be installed under the direct supervision of a licensed or journeyman plumber.

PART 2 PRODUCTS

2.01 SANITARY WASTE, VENT, AND STORM DRAIN PIPING:

- A. All waste and drain pipe fittings shall be long radius fittings. Vent piping may be short radius.
- B. Prior to commencing work, check invert elevations required for sewer connections, confirm inverts and verify proper slope for drainage and proper cover to avoid freezing and damage.

2.02 UNDERGROUND DWV PIPE AND FITTING MATERIALS:

- A. Service weight Hub and Spigot pipe, Class SV, cast iron conforming to ASTM A74 and CISPI 301. Piping shall bare the CISPI stamp. Cast iron joints shall be made with single piece compression type elastomeric gaskets conforming to ASTM C564. Gaskets shall conform to CISPI 310.
- B. Schedule 40 polyvinyl chloride (PVC), conforming to ASTM D2665, with solvent welded joints. Solvent cement conforming to ASTM D2564. Polyvinyl Chloride (PVC): Schedule 40 PVC shall not be used where waste temperature may exceed 140°F, such as mechanical equipment rooms, commercial kitchens, and sterilizer areas. "Push-on" type fittings with gaskets or Coextruded composite PVC (cellular core) piping are not acceptable.
- C. Hubless cast-iron soil pipe shall not be installed underground, under concrete floor slabs, or in crawl spaces below kitchen floors.

2.03 ABOVEGROUND DWV PIPE AND FITTING MATERIALS:

- A. Service weight HUB and spigot pipe, Class SV, cast iron, conforming to ASTM A74 and CISPI 301 piping shall bare the CISPI stamp. Cast iron joints shall be caulked and leaded or compression type joints using single piece, positive seal, elastomeric gasket conforming to ASTM C564.

- B. Service weight, Class SV, no-hub cast iron, conforming to CISPI 301, with neoprene gasket clamp and shield joining assembly conforming to CISPI 310. Coupling shall be Husky SD4000, or equal.
- C. Copper tubing, DWV grade, hard temper, conforming to ASTM B306, solder joints with fittings conforming to ANSI B16.33 and ANSI B16.29.
- D. PVC-DWV pipe and fittings conforming to ASTM D2665 with solvent welded joints. Solvent cement conforming to ASTM D2564. "Push-on" type fittings with gaskets or Coextruded composite PVC (cellular core) piping are not acceptable. NOTE: PVC pipe and fitting shall not penetrate or be installed in any part of return-air plenums. Verify all requirements with mechanical drawings.

2.04 WATER PIPE AND FITTINGS MATERIALS:

- A. Underground:
 - 1. Water piping underground within the structure and to a point 5' outside shall be Type K copper conforming to ASTM B88 with silver brazed joints or Type K soft copper with no joints underground.
- B. Aboveground: Piping aboveground shall be of the following material:
 - 1. Copper tubing, hard-drawn, Type L, conforming to ASTM B88, with brazed or solder joint wrought copper fittings.
 - 2. Exposed piping in finished areas shall be chrome-plated brass pipe to the shutoff or stop valve of each fixture.

2.05 VALVES:

- A. Bronze body valves incorporating either copper-zinc alloy exceeding 15 percent zinc content or aluminum alloy for trim material will not be permitted. Manufacturers shall provide alloy designations or chemistry for the materials used in valves. All valves shall be bronze body with screw or solder ends. Stems shall be vertical unless structure dictates otherwise. All valves shall be of the same manufacturer.
- B. Valves shall meet the specification requirements and manufactured by one of the following:
 - 1. Nibco
 - 2. Hammond
 - 3. Stockham
 - 4. Walworth
 - 5. Crane
 - 6. Milwaukee
 - 7. Apollo

C. Valve types acceptable are defined by the Nibco figure numbers indicated below. The other specified manufacturers equivalent is acceptable.

- | | | |
|----|-------------------------|-----------------|
| 1. | Gate - 200 lb. W.O.G. | Fig. 111 S or T |
| 2. | Globe - 200 lb. W.O.G. | Fig. 211 S or T |
| 3. | Check - 200 lb. W.O.G. | Fig. 413 S or T |
| 4. | Balance Valve - Hammond | Fig. 308 |
| 5. | Ball Valve -Full Port | Fig. 585 S or T |
| 6. | Butterfly Valves | Fig. N200235 |

D. Valve Stems: Shall be oriented for accessibility as approved by the Owner's representative and/or the Engineer. Do not install valves with stems in the downward direction.

E. Installation:

1. Location of Valves: Provide an accessibly located valve where indicated or required for proper system, specialty and equipment operation and maintenance.
2. Valves shall be installed so no forces are transmitted to the valve through the piping supports.
3. Valves Required for Each Flow Path: Provide combination balancing and shut-off valve in all multi-zone circulating systems, and at all equipment where indicated for proportioning flow.
4. Gate Valves: Install gate valves for shut-off and isolating service, to isolate equipment, parts of systems or vertical risers.
5. Globe or Angle Valve: Install globe or angle valves for throttling service and control device or meter by-pass.
6. Ball Valves: Two and one-half (2-1/2) inches and smaller - Use for directional flow and quick-acting applications, interchangeably in place of gate and globe valves.
7. Butterfly Valves: Two and one-half (2-1/2) inches and larger - Use butterfly valves only where indicated on contract drawings. Use iron body, aluminum bronze disc, 416 stainless steel stem, EPDM seat, wafer design, lever operator to six (6 inch) size, gear operated and crank for (8 inches) and above.
8. Check Valves: Shall be spring type on discharge of pumps and water booster pumps.

F. Cleaning: All valves and appurtenances shall be flushed clear of all foreign material after installation.

G. Testing: Field-test all valves and appurtenances for proper operation, proper adjustments and settings, freedom from vibration, binding, scrapings, and other defects. Check all

valve supports for strength and high quality workmanship. All defects shall be corrected. Hydrostatic and leakage tests shall be performed as specified in this Division of work.

2.06 MISCELLANEOUS MATERIALS:

- A. Nipples: Nipples shall be the same material as the piping in which installed.
- B. Unions: Unions shall be brass or bronze, either threaded or with solder joint ends for use in copper tubing.
- C. Flanges: Flanges shall be steel, 150 pound, for ferrous piping, or wrought copper or bronze.
- D. Gaskets: Gaskets shall be full face flat type made of synthetic rubber. Red rubber gasket shall be used for copper piping.
- E. Floor, Wall, and Ceiling Escutcheon Plates: Provide split hinged, locked type, or one-piece escutcheon plates of pressed steel with set screw and heavy coating of copper, nickel, and chromium.
- F. Backflow Preventer: Backflow preventer shall be the type and model as indicated on the drawings. All devices shall be tested and listed in accordance with FCCCHR-01 and be on the approved list of the S.C. Department of Health and Environmental Control (DHEC) or applicable agency in other states. Reduced pressure principle backflow preventers shall conform to ASSE ANSI/ASSE 1013. Backflow preventers with intermediate atmospheric vent shall conform to ASSE ANSI/ ASSE 1012. Hose applied atmospheric type vacuum breakers shall conform to ASSE ANSI/ASSE 1011. Pipe applied atmospheric type vacuum breakers shall conform to ASSE ANSI/ASSE 1001. Air gaps in plumbing systems shall comply with ASME A112.1.2. Pipe all relief valves to floor drain or as directed on drawings.
- G. Trap Primer Valve: All-bronze primer valve with integral vacuum breaker. Zurn Series 1022, PPP Inc. "Prime-Rite", or approved equal with Zurn #ZANB-1460-3 access panel. Where approved by local authorities, "Proset" "Trap Guard" inserts may be used in lieu of trap primers on floor drains and drain hubs.
- H. Solder: SOLDER AND FLUX SHALL BE "LEAD FREE". "Lead Free" shall be defined as less than 0.2 percent lead in solder and flux and less than 8.0 percent in pipes and fittings. All solder joints in potable water piping shall be 95/5 tin/antimony.
- I. Install pre-manufactured shock arresters at each hot and cold water supply as recommended by manufacturer. Shock arresters shall be tested and rated in accordance with PDI-WH-201 and ASSE 1010. Off set to avoid obstruction. Install water hammer arrestors complete with accessible isolation valve. Shock arresters shall meet the specification requirements and manufactured by one of the following:
 - 1. PPP Inc.
 - 2. Zurn
 - 3. Watts

4. Josam
5. Souix Chief

J. Pipe Sleeves:

1. Pipe sleeves in exterior walls, below and above grade, footings, foundations or floor shall be zinc-coated steel pipe. Provide stress relieving arch for pipes passing through horizontal grade beams or footing and where required by structural conditions.
2. Sleeves in firewalls shall be zinc-coated steel pipe.
3. Sleeves in non-rated walls and partitions shall be not less than 24 gauge zinc-coated sheetmetal.
4. Isolate copper piping from sleeve with hair felt, vinyl, or other approved isolator.

2.07 PIPING FREEZE PROTECTION:

- A. Where any water piping is exposed to outdoor air temperature, provide freeze protection. This shall apply but not be limited to the following piping systems.
 1. Domestic cold water, hot water, and hot water recirculating piping and P-traps.
- B. Freeze protection of piping shall be by means of automatic heat tape applied to pipe to prevent water temperature from dropping below 38°F when outside air temperature is per the ASHRAE 2.5% Extreme Wind Speed column, "Table 1A - Heating and Wind Design Conditions - United States". For example, the Myrtle Beach, South Carolina area per the 2.5% temperature is 15°F.
- C. Heat tape shall be Chromalox Type TBT / Raychem XL-Trace with integral thermostat set at 40°F. Heat tape shall dissipate a minimum of 7 watts per lineal foot when supplied with 120V AC current. Heat tape shall be installed in strict accordance with manufacturer's written recommendations and instructions.

2.08 MISCELLANEOUS FITTINGS/COMPONENTS:

- A. Roof Drains: Not Used
- B. Floor Drains: Coated cast iron body drain with nickel-bronze grate, membrane clamping device, bottom outlet of size indicated with connection of type as required. Provide trap primer connection for floor drains. Floor drains shall meet the specification requirements and manufactured by one of the following:
 1. Zurn #ZN-415-6B
 2. Smith
 3. Josam
- C. Traps: Each fixture and piece of equipment requiring connections to the drainage system shall be equipped with a trap. Each trap shall be placed as near the fixture as possible

and no fixture shall be double trapped. Provide deep seal cast iron traps on each floor drain.

- D. Wall Hydrants: Wall hydrants shall be automatic draining, vacuum breaker-backflow protected, frost-proof wall hydrant, 3/4" water supply connection and 3/4" male hose thread. Provide one (1) loose key for each hydrant and give to Owner. Hydrants shall meet the specification requirements and manufactured by one of the following:
1. Woodford
 2. Zurn
 3. Smith
 4. Josam
- E. Hose Bibs: Hose bibs shall be the vacuum breaker-backflow protected faucet. Provide 1/2-inch inlet connection and 3/4-inch male hose thread. Provide one (1) loose key for each hydrant and provide to General Contractor/Owner. Hose bibs shall meet the specification requirements and manufactured by one of the following:
1. Woodford #24 with Nidel vacuum breaker
 2. Zurn
 3. Smith
 4. Josam
- F. Thermometer: Provide 9-inch scale and 3-1/2-inch stem industrial adjustable angle thermometer. Provide separable socket to match stem on thermometer. Range shall be 30 degrees to 180 degrees F. Thermometer shall meet the specification requirements and manufactured by one of the following:
1. Trerice Company
 2. Taylor
 3. Marshtown
 4. Marsh.
- G. Reducing Valves: Bronze construction, field adjustable for desired pressure, stainless steel trim, suitable for potable water. Reducing valve shall meet the specification requirements and manufactured by one of the following:
1. Watts Regulator Company Model No. 223
 2. Conbraco
 3. Sarco
- H. Dielectric Fittings: All sizes - dielectric union with galvanized or plated steel female pipe-threaded end and copper solder-joint end.
- I. Thermostatic Mixing Valves: Mixing valves, thermostatic type, shall be line size and shall be constructed with rough or finish bodies either with or without plating. Each valve shall be constructed to control the mixing of hot and cold water and to deliver water at a desired temperature regardless of pressure or input temperature changes. The control element shall be of an approved type. The body shall be of heavy cast bronze, and interior parts shall be brass, bronze, or copper. The valve shall be equipped with

necessary stops, check valves, unions, and sediment strainers on the inlets. Mixing valves shall maintain water temperature within 5 degrees F of any setting.

- J. Cleanouts, including PVC piping system, shall be iron body ferrules with taper thread plugs of either brass or cast bronze, raised hexagonal heads for wall cleanouts and countersunk plugs with slots for floor cleanouts. Provide floor cleanout body and frame with round adjustable scoriated covers attached to the body or plug by machine screws. Cleanouts shall be full line size. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Install with clearance at cleanout for rodding of drainage system. Cleanouts shall meet the specification requirements and manufactured by one of the following:

1. Zurn
2. Smith
3. Josam

Cleanouts as follows:

| | |
|------------------------|---|
| Unfinished areas | Zurn #Z-1440-BP |
| Finished areas - walls | Zurn #ZN-1441-BP-VP |
| Floors | Zurn #Z-1400-VP - Where cleanouts occur in carpet areas, provide carpet flange (-cf). |

2.09 PIPE SUPPORTS:

- A. Provide and install pipe supports, hangers and rods. Pipe supports, hangers and rods shall be furnished and installed per Specification section 15120.

2.10 ACCESS DOORS AND PANELS:

- A. Furnish to General Contractor factory fabricated doors and panels for installation at all places where specialties, valves, equipment, etc., are inaccessible. Access means to be of adequate size for intended service and of approved manufacture, finish and type. Instruct General Contractor where to install access means and check for proper location. Submit shop drawings.
- B. Access doors and panels shall be fire rated the same as the wall, ceiling or floor in which it is installed.
- C. Access doors shall meet the specification requirements and manufactured by one of the following:
1. Karp
 2. Josam
 3. Acudor
 4. Elmdor/Stoneman
- D. Access doors for ball valves shall be installed as to allow the valve handle to face the door opening when in the "off" position.

2.11 FLASHING:

- A. Where pipes pass through the roof, flash with 4-lb. lead enclosing pipe and extending 8" in all directions along roof. Turn down into vent a minimum of 2-inches and provide flashings to the roofing contractor for installation. Plumbing contractor shall turn down flashings into vent.
- B. PVC vent shall not be exposed above the roof; flashing shall completely cover the vent.

2.12 FIRESTOPPING:

- A. All piping passing through walls, floor, ceiling and roof (fire-rated and non-rated) shall be sealed with a firestopping system conforming to UL 1479 and ASTM E 814.
- B. Firestopping system shall consist of 3M Company CP-25 caulk, 303 putty, FS-195 strips and CS-195 sheets.
- C. Firestopping shall be applied according to the manufacturer's written instructions.
- D. PVC piping shall not penetrate or be installed in fire-rated wall, floor or ceiling of the structure.

2.13 IDENTIFICATION OF VALVES AND PIPING, AND EQUIPMENT:

- A. Valves and piping shall be identified by metal tags for valves and pre-coiled markers/ strap around/colored tape for piping as manufactured by Seton Identification Products or approved equal.
- B. Valve tags shall be 1-1/2" diameter brass tags with black filled letters not less than 1/4" high. Tags shall be attached to valves with "S" hooks or brass jack chain.
- C. Each valve tag as described above shall have identifying letters designating the system on which it is installed.
- D. Pipe labels shall indicate fluid/gas in the pipe and direction of flow.
- E. Provide engraved rigid 3" x 1" Phenolic labels with 1/4" minimum white letters on black background fastened to each piece of equipment in multiple system projects. Equipment shall be defined as boilers, water heaters, mixing valves, etc.

2.14 CLEANING AND PAINTING:

- A. The plumbing contractor shall "touch up" paint, to restore to original "new" appearance, all equipment installed under this contract in which the factory applied finish was damaged or scratched during construction and which is not otherwise to be painted by the General Contractor.
- B. All structural steel, rods, equipment stands, etc., installed by this contractor whether

concealed or exposed shall be cleaned as follows: Uncoated Steel and Iron Surfaces: Remove scale by wire brushing, sandblasting, clean by washing with solvent. Apply treatment of phosphoric acid solution. Prime paint after repairs. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Clean surfaces with solvent. Prime bare steel surfaces. Surfaces inaccessible after placement shall be primed and painted prior to placement. Use "Rust-Oleum clean metal primer" or equal, rust preventative primer and paints suitable for damp atmosphere.

PART 3 EXECUTION

3.01 ROCK EXCAVATION

- A. Remove any rock encountered in the excavation to a minimum dimension of twelve (12) inches outside the pipe (over, under, beside the pipe).
- B. Blasting: permitted only where other excavation methods have been proven ineffective and only after all necessary permits and approvals are acquired.
- C. Rock excavation: Compute on the basis of the depth of rock removed and a trench width two (2) feet larger than the outside diameter of the pipe where one (1) pipe is laid in the trench and three (3) feet larger than the combined outside diameter where two (2) pipes are laid in the trench.
- D. The unit price for rock excavation includes the pit run sand and gravel or crushed stone backfill under the pipe.
- E. Include any rock excavation shown on the plans in the Base Bid.

3.02 INSTALLATION:

- A. Cleanouts, Clearance and Protection: Use blanked tees at 90° bends to provide cleanout capability. Locate cleanouts in floors a minimum of one (1) foot from walls and installed equipment in order to provide proper access. Provide ample space for piping and take particular care to avoid structural interference and conflicts between the several types of mechanical and electrical work. Fully enclose or properly guard belts, pulleys, chains, gears, couplings, projecting set-screws, keys, and other rotating parts located so that any person may come in close proximity thereto.
- B. Cleaning and Protection of Pipe, Fixtures, Materials, and Equipment: Before being placed in position, carefully clean pipe and fittings. Maintain all pipe in a clean condition. Close pipe openings with caps or plugs during installation. Tightly cover fixtures and equipment and protect against dirt, water, and chemical or mechanical injury. Upon completion of all work, thoroughly clean, adjust, and operate the fixtures, materials and equipment. Pipe shall be protected during handling against impact shocks and free fall. Piping shall be cut accurately to measurements established at the site and shall be emplaced without springing, forcing, excessive cutting or weakening of the building structure.

- C. Buried Piping: Place sewer and water piping in separate trenches below the frostline. Buried piping shall extend from approximately 6 inches above the lower floor or inside the structure wall to a point not less than 5 feet outside the structure or as defined on drawings.
- D. Bell and Spigot Cast Iron Soil Piping: Lay non-pressure pipe with the bell ends in the upgrade direction. Adjust spigots in bells to give a uniform space all around. Blocking or wedging between bells and spigots is not permitted. Replace by one of proper dimensions any pipe or fitting that does not allow sufficient space for proper caulking or installation of joint material. Make joints with the rubber gaskets previously specified for joints with this piping, except that where it is impractical to install rubber gasket joints, use leaded joints. Install rubber gasket joints in accordance with the recommendations of the pipe manufacturer. Make leaded joints in the following manner: Pack braided or twisted white oakum or hemp rope into the annular space between bell and spigot to a depth that will provide a minimum depth of one inch for leading. Do not allow oakum to project into the bore of finished joints. After gaskets are placed, clean the joints and fill the remaining space with one pouring of molten lead. Caulk lead in a manner that will assure a tight joint without over straining the iron of the bell, and so that after caulking the lead will be practically flush with the base of the bell.
- E. No-hub Cast Iron Pipe Joints: Tighten band and screw assemblies and cast iron clamp assemblies used in conjunction with hubless type cast iron soil pipe to the manufacturer's recommended torque on each band screw with a torque wrench specifically designed for the purpose. Re-torque each screw after not less than 24 hours. All plugs, caps, tees, and bends deflecting 22-1/2 degrees or more shall be provided with a reaction backing or anchor regardless of pipe size.
- F. Installation of Screw-Jointed Piping and Solder-Jointed Tubing: Cut screw-jointed piping and solder-jointed tubing accurately to required measurements and work into place without springing or forcing. Make proper provision for the expansion and contraction of all pipe and tubing lines. Free pipe and fittings from fins and burrs. Make screw joints with a lubricant or polytetrafluoroethylene tape applied on the male threads only; full cut threads and not more than three threads on the pipe shall remain exposed. Give all exposed ferrous pipe threads, after being installed and tested, one (1) coat of red lead and oil paint. Cut all copper tubing with square ends, and remove all burrs and fins. Carefully handle and protect tubing and replace all tubing cut, dented, or otherwise damaged with new tubing. Clean end of tubing and fittings by wire brush or abrasive. Apply a non-corrosive rosin-type flux to the outside surface of tubing ends, and on the recess inside of fittings. Remove stems and washers of solder-joint type valves before soldering. Provide unions and union type connections and shut-off valves for all fixtures and equipment for ready disconnection. On ferrous pipe 3-inches in diameter and smaller, unions shall be 150 psig steam working pressure zinc-coated malleable iron ground-joint type. On ferrous pipe 4 inches in diameter and larger, unions shall be 125 psig steam working pressure forged steel flange type, with gaskets of 1/16-inch-thick best quality rubber or cloth inserted rubber. On sanitary piping, tucker connections may be used. Support pipe and tubing hung from structure by heavy adjustable hangers. All hangers and collars shall be of the sizes suitable for the weight of the pipe and tubing. Make all changes in sizes of pipe and tubing with reducing fittings. Provide dielectric fittings at transitions between ferrous and copper piping.

- G. PVC pipe and fitting joining method shall be per the manufacturer's written instructions. PVC pipe and fitting shall not penetrate or be installed in any part of return- air plenums. Piping located in air plenums shall conform to NFPA 90A requirements. Piping located in shafts that constitute air ducts or that enclose air ducts shall be noncombustible in accordance with NFPA 90A.
- H. Water Systems: Install water systems with a fall towards the shut-off valve or the lowest fixture. Provide branches from hot and cold water lines to all fixtures, water-heating units, and outlets indicated. Parallel Pipes: Where several pipes are run together, they shall run parallel and shall be spaced at distances which will permit access for servicing, unless provisions for pitching the pipes dictate different elevations.
- I. Sanitary Systems: Provide sanitary systems where practicable, with Wye fittings and 1/8 or 1/16 bends or combination Wye and 1/8 bends. All fixtures not specified to be provided with traps as integral parts of their outfits and all drains shall have separate traps with cleanouts. Waste lines shall be not less than 1-1/2 inches in diameter above grade and 2" below grade. Individually vent all fixtures or connect to a vented soil or waste line. Unless indicated otherwise, sanitary piping shall form circuit or loop vents with no dead ends or inverted siphons. Connect circuit or loop vent lines at a height of not less than 12 inches above the fixtures served. Horizontal vents shall slope down to waste or soil branch or stack. Grade horizontal soil and waste piping 1/4 inch per foot for piping 2-1/2" and less in size and 1/8 inch per foot for piping 3" and larger. Extend vertical stacks full size to not less than 12 inches above the roof and place in position before the roofing is applied. Where practicable, two (2) or more vent lines may be connected and extended as one (1) pipe through the roof. Install cleanouts at the foot of each soil or waste line, at changes in direction in lines, and where indicated; however, within the building, the distance between cleanouts in horizontal runs shall in no case exceed 75 feet. Extend cleanouts in floors full size to the floor level with outlets fitted with extra heavy cast brass or cast iron ferrule with countersunk caps, except no cleanouts shall exceed 6 inches in diameter. See detail on plans.
- J. Water Valves: Install water valves in accessible places and locate as follows:
1. Shut off valve on each building supply main, all sub-mains and to each fixture not provided with compression stop or with other auxiliary shutoff valve at the bottom of each riser of all hot and cold water lines, and where indicated.
- K. Installation of Fixtures: The Contractor shall provide all necessary material and labor to connect the plumbing system and all fixtures and equipment having plumbing connection, as specified in other sections of these specifications. Trap drainage connections. Equip the supply line to each item of equipment or fixture, except faucets, flush valves, or other control valves which are supplied with an integral stop, with a cutoff valve to enable isolation of the item for repair and maintenance without interfering with operation of other equipment or fixtures. Anchor supply piping to all fixtures, shower heads, and flush valves to prevent movement. Make connections between the earthenware of fixtures and the flanges on soil pipe gas and watertight with a one-piece special molded plastic gasket. Do not use all bulk material including putty and plastics for gaskets. Secure floor drains to the waterproofing or flashing in watertight manner.

Caulk all fixtures to wall/floor with white grout.

- L. Pipe Sleeves: Provide pipe sleeves where pipes and tubing pass through walls, floors, roofs, and partitions. Place sleeves during construction of the building and at no time shall jack hammers be used. Space between pipe, tubing, or insulation and the sleeve shall be not less than ½ inch. Securely hold sleeves in proper position and location before and during construction. All sleeves shall be of sufficient length to pass through entire thickness of walls, partitions, or slabs. Sleeves in floor slabs shall extend 2 inches above the finished floor. Firmly pack space between the pipe or tubing on both ends of sleeve with firestopping materials listed by UL for the assembly in which located. Provide sleeves located in waterproofed construction with flanged end clamping ring.
- M. Supports and Fastening: Secure fixtures, trimmings, accessories, and appurtenances to concrete and brick by 1/4 inch brass expansion bolts not less than 4 inches long, to terra cotta and concrete masonry units by 1/4 inch brass toggle or through bolts, to wood by not less than No. 12 round-head brass wood screws, and to gypsum with steel plates 1/8 inch thick, 6 inches wide, and not less than 24 inches long at the back of the through bolts. Expansion bolts shall be of a length sufficient to extend at least 3 inches into solid concrete or brickwork. Provide through bolts with plates or washers at the back and set so that heads, nuts, and washers are concealed by the plaster. Exposed heads of bolts and nuts shall be nickel-chromium plated hexagons with rounded tops. Provide nickel-chromium plated brass washers where necessary. Do not use plastic anchors to carry any load.
- N. Hangers and Supports: Pipe supports, hangers and rods shall be furnished and installed per Specification section 15120. Furnish and install supports to carry adequately the weight of the line. Install hangers and supports so that thermal expansion and contraction of piping will occur in the directions desired and so as to permit adjustment after installation while supporting the load. Use wall brackets for supporting piping adjacent to walls or other vertical surfaces. Use bolted steel clamps for supporting vertical lines. Place supports as near as possible to concentrated loads and, when practicable, immediately adjacent to changes in direction. Support horizontal piping so as to maintain alignment, prevent grade reversals, and prevent sagging in excess of 0.1 inch. Prevent vibration and undue strains on equipment by use of vibration dampers.

O. SEISMIC REQUIREMENTS

1. Seismic protection for all piping and equipment shall be furnished and installed per Specification Section 15015.
2. Equipment supports and anchoring shall be designed to withstand the seismic forces computed. When such forces are applied, the equipment shall not be displaced or overturned, and shall not be made inoperable. Anchorages shall conform to recommendation of equipment manufacturer. When equipment is subject to thermal expansion, anchoring design shall allow this expansion.
3. Piping Supports and Anchoring: Upon application of seismic forces of computed

intensity, piping shall remain fully connected into operable systems and shall not be displaced sufficiently to damage adjacent or connecting equipment, or building members. Thermal expansion flexibility shall not be impaired.

4. Seismic Design of Equipment shall include, but not limited to the following:
 - a. Boilers, burners.
 - b. Control panels.
 - c. All pumps and drives.
 - d. Tank type water heaters.
 - e. Water storage tanks
 - f. Aboveground fuel oil tanks.
 - g. Boiler stacks and breeching.
 - h. Air compressor.
 - i. Water treatment systems.

P. Field Tests, Inspections, and Disinfection: The Contractor shall perform all field tests and shall provide everything required for the tests. The Architect/Engineer will witness all field tests and conduct all field inspections. The Contractor shall give the Architect/Engineer ample notice of the dates and times scheduled for tests. Any deficiencies found shall be rectified and work affected by such deficiencies shall be completely retested at no additional cost to the Owner.

1. Inspection: Inspection shall continue during installation and testing. The right is reserved to inspect any equipment at the manufacturer's facility, during or after manufacture, and to require reasonable witness tests before shipment. Perform a final inspection of the equipment prior to installation to determine conformity to the type, class, grade, size, capacity and other characteristics specified herein or indicated. Correct or replace all equipment rejected prior to installation.
2. Water Distribution Piping Test: Before fixtures are set, subject the entire hot and cold piping systems to a hydrostatic pressure test of 150 pounds per square inch with water for not less than 4 hours in order to permit inspection of all joints with no evidence of leakage. Where a portion of the water distribution piping is to be concealed before completion, test this portion separately as specified for the entire system.
3. Sanitary Waste and Vent Piping Test: Before the installation of any fixtures, cap the ends of the system and all lines, fill with water to the roof, and allow to stand for at least 30 minutes without leakage. Make tests within building with piping exposed. If the system is tested in sections, tightly plug each opening, except the

highest opening of the section under test, and fill each section with water and test with at least a 10-foot head of water. Test underground piping before backfilling with at least a 10-foot head of water.

4. Disinfection of Water Distribution System: After pressure tests have been made, thoroughly flush the entire domestic water distribution system with water until all entrained dirt and mud have been removed, and sterilize by chlorinating material. The chlorinating material shall be either liquid chlorine conforming to Fed. Spec. BB-C-120, or hypochlorite conforming to Fed. Spec. O-C-114, or Fed. Spec. O-S-602, Grade 1 (5 percent available chlorine) or Grade 2 (10 percent available chlorine). The chlorinating materials shall provide a dosage of not less than 50 parts per million and shall be introduced into the system or part thereof in an approved manner. Retain the treated water in the pipe for 24 hours, or fill the system or part thereof with a water-chlorine solution containing at least 200 parts per million of chlorine and allow to stand for 3 hours. Open and close all valves in the system being disinfected three times during the contact period. Then flush the system with clean potable water until the residual chlorine is reduced to less than 1.0 p/m. During the flushing period open and close all valves and faucets three times. Have three (3) random samples from systems tested by independent testing laboratory approved by the State Health Department and deliver certificates of approval to Architect, County Sanitarian, Engineer and any state and local authorities having jurisdiction for water quality. Take samples no sooner than 24 hours after flushing, and analyze in accordance with AWWA C601. All laboratory fees are to be included in the Plumbing Contract. The Contractor will be responsible for preventing use of water from systems for human consumption until tested and approved. Should any of the reports prove unfavorable, the entire disinfection and sampling process shall be repeated.

Certificates indicating negative results of bacteriological tests MUST BE PROCURED before building can be accepted.

END OF SECTION

SECTION 15465

WATER HEATER - ELECTRIC RESIDENTIAL/LIGHT COMMERCIAL

PART 1 GENERAL

1.01 WORK INCLUDED:

- A. Work in this section shall include water heater(s) as indicated on the drawings and specified herein. Included shall be all materials and appurtenances as required for a complete installation.
- B. Provide and install piping, valves, trim indicated or specified on the drawings, and with factory installed ASME rated and approved temperature and pressure relief valve. Mount unit as noted on the details and drawings.
- C. Provide seismic restraint bracing in accordance with International Building Code requirements.

1.02 WARRANTY:

- A. The water heater manufacturer shall warrant defects in workmanship and material for a period of (6) six years from date of acceptance for residential installations; one (1) year from date of acceptance for commercial installations.

PART 2 PRODUCTS

2.01 WATER HEATER:

- A. Tank shall be glass lined, UL, and NSF certification labeled, ASME compliant with 150 psi working pressure. Water heater shall be insulated with high-density insulation or foam and covered with metal jacket with baked enamel finish.
- B. Provide immersion type elements, surface mounted thermostats, and controls completely pre-wired at factory.
- C. The heater shall include anode rods to provide maximum cathodic protection of all internal tank surfaces.
- D. The heater shall be supplied with a factory installed ASME rated and approved temperature and pressure relief valve. Temperature/relief valve shall have a temperature setting of not more than 212 degrees F. and a pressure setting not exceeding the tank or water heater manufacturer's rated working pressure or 150 psi, whichever is less. The relieving capacity of each pressure relief valve and each temperature relief valve shall equal or exceed the heat input to the water heater or storage tank.

- E. The heater shall comply with the latest ASHRAE 90A energy standards.
- F. The water heater shall be a standard product of a manufacturer regularly engaged in the design, testing, assembly, and cataloging of complete UL approved units. Products as may be available from the following list equivalent to the specified manufacturer's model on the drawings and comparing with specified requirements herein are acceptable:
 - 1. A.O. Smith Corporation
 - 2. Lochinvar Water Heater Division
 - 3. Bradford White
 - 4. Rheem Commercial
 - 5. State Industries, Inc

PART 3 EXECUTION

3.01 INSTALLATION:

- A. Water heater shall be installed as indicated and per manufacturer's written instructions, using dielectric unions at connections to water distribution system(s) or brass nipples.
- B. Use type "L" copper to pipe temperature and pressure relief valve and drain pan to floor drain or as indicated on the drawings.
- C. Provide auxiliary drain pan per International Plumbing Code.
- D. Connect hot and cold water piping to the water heater with ball valves and unions. Connect hot water circulating piping to the heater with ball valves, check valve, and union.
- E. Set thermostat to deliver 140 F water temperature to the mixing valve.
- F. Provide drain valve, mixing valve, vacuum breaker, bronze circulating pump, immersion aquastat to control recirculation pump, thermometer, pressure gauge and ASME expansion tank as specified on drawings.
- G. Install piping adjacent to the equipment to allow servicing and maintenance.
- H. All power wiring and final wiring connections will be furnished by the Electrical Contractor. Disconnects will be provided by the Electrical Contractor unless otherwise specified on the drawings. Control wiring shall be the Plumbing Contractor's responsibility, and all material and workmanship shall comply with Section 16000 of the specifications.

END OF SECTION

SECTION 15465

WATER HEATER - ELECTRIC RESIDENTIAL/LIGHT COMMERCIAL

PART 1 GENERAL

1.01 WORK INCLUDED:

- A. Work in this section shall include water heater(s) as indicated on the drawings and specified herein. Included shall be all materials and appurtenances as required for a complete installation.
- B. Provide and install piping, valves, trim indicated or specified on the drawings, and with factory installed ASME rated and approved temperature and pressure relief valve. Mount unit as noted on the details and drawings.
- C. Provide seismic restraint bracing in accordance with International Building Code requirements.

1.02 WARRANTY:

- A. The water heater manufacturer shall warrant defects in workmanship and material for a period of (6) six years from date of acceptance for residential installations; one (1) year from date of acceptance for commercial installations.

PART 2 PRODUCTS

2.01 WATER HEATER:

- A. Tank shall be glass lined, UL, and NSF certification labeled, ASME compliant with 150 psi working pressure. Water heater shall be insulated with high-density insulation or foam and covered with metal jacket with baked enamel finish.
- B. Provide immersion type elements, surface mounted thermostats, and controls completely pre-wired at factory.
- C. The heater shall include anode rods to provide maximum cathodic protection of all internal tank surfaces.
- D. The heater shall be supplied with a factory installed ASME rated and approved temperature and pressure relief valve. Temperature/relief valve shall have a temperature setting of not more than 212 degrees F. and a pressure setting not exceeding the tank or water heater manufacturer's rated working pressure or 150 psi, whichever is less. The relieving capacity of each pressure relief valve and each temperature relief valve shall equal or exceed the heat input to the water heater or storage tank.

- E. The heater shall comply with the latest ASHRAE 90A energy standards.
- F. The water heater shall be a standard product of a manufacturer regularly engaged in the design, testing, assembly, and cataloging of complete UL approved units. Products as may be available from the following list equivalent to the specified manufacturer's model on the drawings and comparing with specified requirements herein are acceptable:
 - 1. A.O. Smith Corporation
 - 2. Lochinvar Water Heater Division
 - 3. Bradford White
 - 4. Rheem Commercial
 - 5. State Industries, Inc

PART 3 EXECUTION

3.01 INSTALLATION:

- A. Water heater shall be installed as indicated and per manufacturer's written instructions, using dielectric unions at connections to water distribution system(s) or brass nipples.
- B. Use type "L" copper to pipe temperature and pressure relief valve and drain pan to floor drain or as indicated on the drawings.
- C. Provide auxiliary drain pan per International Plumbing Code.
- D. Connect hot and cold water piping to the water heater with ball valves and unions. Connect hot water circulating piping to the heater with ball valves, check valve, and union.
- E. Set thermostat to deliver 140 F water temperature to the mixing valve.
- F. Provide drain valve, mixing valve, vacuum breaker, bronze circulating pump, immersion aquastat to control recirculation pump, thermometer, pressure gauge and ASME expansion tank as specified on drawings.
- G. Install piping adjacent to the equipment to allow servicing and maintenance.
- H. All power wiring and final wiring connections will be furnished by the Electrical Contractor. Disconnects will be provided by the Electrical Contractor unless otherwise specified on the drawings. Control wiring shall be the Plumbing Contractor's responsibility, and all material and workmanship shall comply with Section 16000 of the specifications.

END OF SECTION

SECTION 15490

PLUMBING FIXTURES AND TRIM

PART 1 GENERAL

1.01 QUALITY ASSURANCE:

- A. All plumbing fixtures and trim (accessories) shall be of new and first quality from a single manufacturer conforming to specifications herein. Fixtures shall be installed to manufacturer's written instructions. Where written instructions are not provided, fixtures shall be installed to a first class installation and be in perfect condition. Fixtures shall be supplied complete with supply pipes, individual fixture stop valves, traps, bolt caps, faucets, vacuum breakers, strainers, set screw type escutcheons, nipples, tubing covers cut to correct length, supports and hole punching correct for faucet furnished, etc., as required. Metal parts to be heavily chromium plated, including traps, exposed pipe, and escutcheon plates. Upon completion of all work, thoroughly clean and adjust all fixtures and faucet aerators.
- B. All fixtures of like kind shall be the product of the same manufacturer.
- C. All electric water coolers, drinking fountains, bubblers, faucets, hot and cold water dispensers, ice makers, supply stops, and end point control valves shall comply with requirements of ANSI/NSF Standard 61. Certification of NSF compliance shall be displayed on these products or their packaging.

PART 2 PRODUCTS

2.01 REQUIREMENTS:

- A. All vitreous china fixture colors shall be as selected by the Architect.
- B. All exposed piping and metal work in connection with fixtures shall be chromium plated brass.
- C. Whenever possible the supply and/or drainpipes shall connect to walls and not to floors, and all exposed junctions to walls shall have chromium plated escutcheons, flanges, or thimbles required, neatly and firmly secured in place.
- D. Provide polished chrome plated traps, wall nipples, and supply stops for all plumbing fixtures. P-traps shall be 17 gauge and have cast brass nuts and cleanout plug. Provide setscrews in all wall escutcheons.
- E. All fixtures shall be adequately supported; each floor-mounted fixture shall be set solidly upon the floor, bearing evenly on its entire base; each wall hung fixture shall be supported by tubular carriers bolted to the floor with wall plates and bolts.

- F. Closet seats shall be heavy-duty solid plastic, open front, round or elongated to match bowl, have self-sustaining check hinges. Seats shall be Bemis #1655-SS/C for elongated bowls and #955-SS/C for round bowls. Seats shall meet the specification requirements and manufactured by one of the following:
1. Beneke
 2. Olsonite
 3. Church
- G. Flush valves shall be furnished at each water closet and urinal. Valves shall be exposed with non hold open handles, screw driver stop, vacuum breaker, adjustable tailpiece, sweat solder adapter, vandal proof cap, and set screw in the escutcheon.
1. Water closet flush valves shall be Sloan Regal #111-XL-YK-1.6. Flush Valves shall meet the specification requirements and manufactured by one of the following:
 - a. Sloan
 - b. Zurn
 2. Urinal flush valves shall be Sloan #186-1-XL-YK for 3/4" top spud connections and #180-1-XL-YK for 1 1/4" top spud connections. Flush Valves shall meet the specification requirements and manufactured by one of the following:
 - a. Sloan
 - b. Zurn
- H. Flush valve handles on all handicapped water closets shall be turned to the wide side of the toilet area, room, or stall. The height of the flush valve handle for handicapped water closets and urinals shall not exceed 44" AFF and shall comply with ADA requirements.
- I. Flush valves for all water closets and urinals shall be furnished with a stand off bracket, solid ring, and threaded rod, similar to "YK" variation. The bracket to be field installed on supply tube as high above fixture and under the diaphragm of each flush valve.
- J. Connections between brass and cast iron soil and waste piping shall be made in compliance with the regulations and requirements of the local authority having jurisdiction.

2.02 FIXTURE LIST:

- A. Fixtures shall meet the specification requirements and manufactured by one of the following:
1. American Standard
 2. Kohler
 3. Zurn

- B. Stops, supplies, grid drains, continuous waste, and P-traps shall meet the specification requirements as follows:
 - 1. Traps shall be 1-1/4" x 1-1/2" for lavatories; EBC model #TA-140-CF, or equal.
 - 2. Traps shall be 1-1/2" x 1-1/2" for sinks; EBC model # TA-150-CF, or equal.
 - 3. Sink waste shall be EBC model #WE150L16 or #WE150L21 end outlet for 16" or 21" centers.
 - 4. Fixture supplies shall be EBC #LA-10-CF for lavatories, #LA-12-CF for sinks, #CA-10-CF for water closets, and #LSH-15-BKWC for handicapped lavatories.
 - 5. Strainers shall be EBC #SG7 for lavatories, #SB-8H for sinks, #7WC for handicapped lavatories, and #SB8CWC for handicapped sinks.

- C. Stops, supplies, grid drains, continuous waste, and P-traps shall be manufactured by one of the following:
 - 1. McGuire
 - 2. Zurn
 - 3. EBC
 - 4. Dearborn Brass
 - 5. Keeney

2.03 HANDICAPPED PROTECTION:

- A. Furnish and install at each handicapped accessible lavatory or sink a Truebro model #102-W Handi-Lav-Guard Insulation Kit. At offset strainer handicapped lavatories, provide model #105-W.

- B. Trap insulators shall meet the specification requirements and manufactured by one of the following:
 - 1. Brocar Products Inc,
 - 2. Engineered Brass Company
 - 3. McGuire, Zurn Industries
 - 4. Dearborn Brass
 - 5. Keeney

- C. All trap and supply insulators shall be smooth, white, flame retardant vinyl, and comply with latest requirements of the Americans with Disabilities Act (A.D.A.).

PART 3 EXECUTION

- A. All spaces between fixtures and walls, counter tops, or floors shall be sealed with a white non-hardening paintable caulking compound.

- B. Contractor shall anchor lavatories and water coolers to the wall at bottom to prevent "Lifting" off the carrier fittings.

END OF SECTION

SECTION 15805

AIR DISTRIBUTION SYSTEM

PART 1 GENERAL

1.01 SCOPE:

- A. All ductwork shall be galvanized steel, or as shown on drawings.

1.02 SMACNA GUIDELINES AND CODES:

- A. Complete systems of ductwork shall be fabricated and installed in accordance with the recommended and standard practices contained in the latest edition of the SMACNA "Low Pressure Duct Construction Standard" as published by the Sheetmetal and Air Conditioning Contractors National Association, Inc., or the ASHRAE Guide, Equipment Volume, Chapter 1, "Duct Construction", as published by the American Society of Heating, Refrigeration and Air-Conditioning Engineers.
- B. Comply with International Mechanical Code, ASHRAE Guide, and local codes.

PART 2 PRODUCTS

2.01 GENERAL:

- A. Ductwork: Except as may be specifically noted otherwise on the drawings, ductwork shall be constructed of galvanized steel conforming to ASTM A 527 with a galvanized coating of not less than 1-1/4 ozs. per square foot for both sides. Flexible duct, in lengths not to exceed 6 feet, may be used at diffuser connections provided it is Class 1 complying with UL 181.
- B. Elbows: Radius elbows shall be used generally; however, vaned elbows shall be used where shown on the drawings and/or required to fit restricted spaces.
- C. Accessory Materials: Material for bracing angles, hangers and supports, rivets, screws and other fastening details shall be galvanized steel.
- D. Balancing Dampers: Provide factory-fabricated balancing dampers with locking quadrants at all branch take-offs to facilitate balancing.
- E. Air Distribution Devices: Furnish and install exhaust and supply grilles, registers and air diffusers as shown on drawings and as specified herein. All air distribution devices shall be Price, Carnes, Titus, Air Guide, Metalaire, Universal, Tuttle & Baily, or approved equal.

1. Sound Power Level: For grilles, registers and diffusers selected it shall be such that the sound level in the occupied area shall comply with the NC occupancy recommendations in the ASHRAE Guide. Selection and sizing of all grilles, registers and diffusers shall conform to the manufacturer's published performance data.
 2. Ceiling Supply Air Diffusers: Shall be of design and air pattern indicated on the drawings with volume control key operated from the face of the device. Provide each supply register and diffuser with an air turning device for deflecting air evenly into the throat of the device. Unless otherwise specified on the drawings, all diffusers and registers shall be of aluminum construction, and shall be of the "fabricated" type, not stamped.
 3. Return Air Grilles: Unless otherwise specified on the drawings, shall be of aluminum construction with sponge rubber gasket.
 4. All supply air devices shall be complete with accessories as specified on the drawings.
- F. Fire Dampers: Provide UL fire dampers of suitable arrangement at any point of fire-rated wall/ceiling penetration.
- G. Flexible duct connections shall be provided at inlet and outlet connections to air handlers and fans.

PART 3 EXECUTION

3.01 DUCTWORK AND ACCESSORIES:

- A. Ductwork and accessories shall be installed in strict accordance with NFPA 90A and SMACNA LPDCS, and shall be run approximately as indicated on drawings. Provide offsets and other field changes as necessary to suit the size of factory fabricated equipment actually furnished. Such changes shall be designed to minimize losses in pressure and performance due to sudden expansion and contraction. Transitions shall be used in field changes as well as modifications to connecting ducts.
- B. Duct shall be installed so that ductwork shall operate without chatter, vibration and be airtight so that no dust marks from air leaks will show at connections or outlets. All joints shall be sealed with approved duct sealer.
- C. Elbows, vaned elbows, take-offs, branch connections, transitions, duct volume dampers, flexible connections, other fittings and appurtenances shall conform to SMACNA Duct Construction Manual.
- D. Duct Supports:

1. Supports for concealed ducts shall be not less than 1 inch wide, 22 gauge, galvanized strap hangers spaced in accordance with SMACNA Duct Construction Standards. Hangers shall be installed under insulation with penetrations sealed with mastic. As an alternate, support may be placed outside of insulation if adequately padded to prevent damage to vapor barrier.
 2. Ducts shall be supported and installed so as to be completely free from vibration under all conditions of operation. Supports shall be attached only to structural framing members.
- E. Round ducts shall be tapped into main duct with spin-in type fittings with integral extractors and volume dampers with locking quadrant.
- F. Branches and Tee Connections: Type as indicated on the drawings.
- G. Grille and Diffuser Connections: Air extractors and adjustable dampers are included as accessories to be furnished with the air distribution devices.
- H. Volume Dampers: Install all dampers so that they are accessible for adjustment. Extend damper rod beyond insulation and provide locking device.
- I. Broken places in galvanized sheet metal coating made during forming shall be painted with zinc duct primer.
- J. Access Doors: Shall be hinged and latched. Access doors shall provide ready access to operating parts of any kind. Make doors air tight with a neoprene gasket. Insulate doors in insulated ductwork.
- K. Objectionable Noise, Vibration or Breathing of Ducts: Will not be permitted and the Contractor shall see that such objections are eliminated by anchoring and bracing all ductwork securely to building.
- L. Cleaning of Ducts: Before making final connections to air distribution outlets, the Contractor shall operate fans and shall thoroughly clean out the interior surfaces of all ducts.
- M. Flexible Duct Connections: Flexible connections shall be installed between fan units and metal ducts or casings, and shall comply with NFPA No. 90A.

3.02 TESTING:

- A. Operate all fans and demonstrate quiet and vibration-free operation of duct system.
- B. Measure all air flows and balance system to provide air volumes specified (within 10% plus or minus). Submit balance report prior to requesting final inspection.

END OF SECTION

SECTION 15870

PACKAGED HEAT PUMPS - ROOFTOP

PART 1 GENERAL

1.01 DESCRIPTION:

- A. Complete year round, all electric heat pump heating and cooling packaged systems suitable for rooftop installation complete with controls, accessories and capacities as indicated on the drawings or specified hereinafter.

PART 2 PRODUCTS

2.01 HEAT PUMP - ROOF TYPE:

- A. General: Roof type heat pumps shall be designed, constructed, assembled, rated, and tested in accordance with ARI Standard 210 and 360. Units shall be ARI certified. Units shall have capacities to meet the design conditions as indicated. The unit shall be a factory packaged unit as indicated and shall be suitable for mounting on roof of building. The packaged unit shall consist of refrigerant compressor, cooling coil, condenser, fan, filters, heating coil, control wiring and piping, all factory assembled in a weather proof enclosure mounted on a structural steel base ready for field connection to utilities and ducts. The packaged unit shall be sufficiently rigid and shall be arranged to permit handling by a crane boom or other means. Provide the unit with roof curb, flashing, and transition plenum.
- B. Performance Rating: Cooling capacity of unit shall meet the sensible heat requirements and total heat requirements indicated. In selecting unit size, make true allowance for "sensible to total heat ratio" to satisfy required sensible cooling capacity. Submittals shall include catalog selection data which accounts for sensible to total heat ratio, entering air conditions at evaporator and condenser entering air conditions.
- C. Energy Efficiency Ratio and Coefficient of Performance: Units shall produce not less than the EER and COP ratings of the equipment scheduled on the drawings.
- D. Unit Enclosure: Construct enclosure of galvanized steel not less than 20 US gage thickness, with removable gasketed access panels completely weatherized for outside installation, and properly reinforced and braced. Provide panels and access door for inspection and access to all internal parts. Surface of steel parts shall be factory baked enamel finish. Provide enclosure with adequate reinforced points of supports for setting of the units. Joints shall be air and water tight. Provide protective guard for condenser coil.
- E. Unit Compressor: Unit compressor shall be serviceable hermetic complete with service gauge connections for high and low pressures, crankcase heater, internal overload protection and vibration isolation. The unit shall be provided with controls to prevent the

compressor from short cycling and to prevent the compressor from restarting for a 5-minute period.

- F. Evaporator and Condenser Coils: Evaporator and condenser coils shall be constructed of copper tubes with mechanically bonded aluminum fins.
- G. Evaporator Fan: Evaporator fan shall be forward curved centrifugal. Fans shall be multi-speed direct or belt driven. For belt driven fans provide an adjustable motor mounting base with locking device and adjustable pitch pulley on the fan motor. Fan and fan motor shall have sealed permanently lubricated bearings and shall be statically balanced.
- H. Condenser Fans: Condenser fans shall be direct driven propeller type with vertical discharge. Motor shall be weatherproof construction and shall be permanently lubricated. Provide discharge air guard.
- I. Supplementary Electric Heaters: Supplementary electric heaters shall be provided integral with the unit and shall be as open coil design. Heater shall be provided with primary over-temperature protection with each heater circuit provided with a fuse of the proper size. In addition provide an interlock with the supply air fan or a differential air pressure control to prevent heater operation unless fan is operational. Heater shall be UL listed.
- J. Roof Curb: Roof curb shall be provided by the unit manufacturer and shall be gasketed and insulated. Roof curb shall be National Roofing Contractor Association approved.
- K. Units shall be provided with throw-away filters which shall be replaced at job completion.
- L. Provide smoke detector in return, wired to shut down fan in event of high temperature or smoke, complying with NFPA-90A and International Mechanical Code.
- M. Products as may be available from Trane, Carrier, York or prior approved equivalent to the specified manufacturer's model scheduled and complying with specified requirements herein are acceptable.
- N. Warranty: Units shall be guaranteed against defects in workmanship for a period of one (1) year from date of final acceptance, except that compressors shall be guaranteed for a total of five (5) years.

END OF SECTION

SECTION 15875

SPLIT-SYSTEM HEAT PUMP

PART 1 GENERAL

1.01 DESCRIPTION:

- A. Outdoor-mounted, air cooled, split system heat pump suitable for mounting at grade or on a rooftop. The heat pump selection shall match up to the associated air handler.
- B. Indoor-mounted or out-door mounted (attic or garage) split system air handler shall be a direct expansion variable speed fan coil or a constant speed fan coil with either 2 or 3 blower speed settings (low, medium, high).
- C. Specific manufacturer's model number scheduled on the drawings will define the capacity and application for the work along with the specified requirements herein.
- D. Products as may be available from Trane, Carrier, York or prior approved equivalent to the specified manufacturer's model scheduled and complying with specified requirements herein are acceptable.

1.02 WORKMANSHIP:

- A. Only skilled and experienced workmen shall be utilized for this work. Any work that is not performed in accordance with standard and recommended practices shall be replaced at the expense of the Contractor. Coordinate with all other contractors prior to installing any item of equipment.

1.03 CODES, FEES, ETC.:

- A. Comply with International Mechanical Code, ASHRAE Guide and local codes. Apply for and obtain all permits and comply with local inspection requirements.

PART 2 PRODUCTS

2.01 AIR HANDLER (INDOOR SECTION):

- A. The indoor unit shall be constructed of galvanized steel and coated with baked enamel finish. The cabinet shall be insulated with neoprene coated fiberglass. The cabinet panels shall be easily removed for service to all components. The cabinet shall meet a leakage rate of 2% or less when tested at 1.0 inch of static pressure. The indoor unit shall be complete with direct expansion coil, variable or multi-speed centrifugal fan and motor, condensate collector, and shall be completely wired to terminal block. The indoor unit shall be provided with filter frame and throw-away filters unless noted otherwise. Filters shall be replaced at the completion of the work.

- B. The electric strip heater shall be a component part of the air handler and shall be the KW and electrical characteristics as scheduled on the drawings. Heaters shall be complete with thermal and overload protection, a 24-volt control transformer, insulated terminal box and contactor. In addition, the heater shall be provided with an air flow pressure differential control, wired through the fan motor control circuit.
- C. Provide a smoke detector in the return, wired to shut down fan in event of smoke detection for air handlers exceeding 2,000 cfm of airflow.
- D. Additional accessories to be provided with the air handler as part of the work are as follows:

2.02 HEAT PUMP (OUTDOOR SECTION):

- A. The cabinet/casing shall be galvanized steel with baked enamel finish with a protective, dense louvered or louvered coil guard. The compressor shall be a welded hermetic type with internal vibration isolation and external neoprene mounts. The compressor shall have thermal and over-current protection, high pressure cut-out and crankcase heater. Provide a protective, dense coil guard cap.
- B. Condenser fan shall be direct drive with vertical discharge propeller fan and fan/coil guards. Fan motor shall be totally enclosed, permanently lubricated, inherently protected and resiliently mounted. Fan blades shall be both statically and dynamically balanced.
- C. Condenser coil shall be mechanically bonded fin and tube with changeover valve, quick attach refrigerant couplings, gauge taps, filter-drier and refrigerant metering device.
- D. Control shall be factory wired and shall include an anti-recycle timer control, outdoor thermostat, automatic defrost controls, control transformer, compressor contactor, and wiring terminal block with all components enclosed in a weatherproof compartment.
- E. Refrigerant tubing may be pre-insulated and pre-charged type as provided by the unit manufacturer. Where insulation is exposed to the weather, coat with vinyl lacquer two (2) coats minimum.
- F. Electrical characteristics shall be as scheduled on the drawings.
- G. Additional accessories to be provided with the heat pump as part of the work are as follows:

2.03 HEAT PUMP SYSTEM:

- A. The entire heat pump system shall consist of matched components rated in accordance with A.R.I. 240 and shall be UL labeled.

2.04 WARRANTY:

- A. The units shall be warranted for all parts and labor for one (1) year from date of acceptance with an additional extended four (4) years warranty on the compressor. Register warranties with the manufacturer and provide Owner with copies.

2.05 ROOM THERMOSTAT:

- A. Room thermostat shall be provided for each system and shall be of the programmable electronic type with digital thermometer, fan on-auto switch, emergency heat mode, compressor-on light. 7-day programming shall be provided.

2.06 CONDENSATE DRAIN PIPING:

- A. Piping shall be Schedule 40 PVC with solvent cemented joints. Provide P-trap at unit and insulate entire drain line with 5/8" thick foam plastic insulation, or 1" fiberglass with vapor barrier. Slope piping 1/8th " per foot minimum away from unit.

PART 3 EXECUTION

3.01 HEAT PUMPS:

- A. Heat pumps shall be installed as indicated on the drawings and as recommended in the manufacturer's installation and operating instructions. Outdoor unit shall be mounted on a level concrete pad a minimum of 4" above surrounding grade.

3.02 AIR HANDLERS:

- A. Mount air handler on cork-and-rubber vibration isolators or suspend from building structure with hangers having in-line spring isolators.
- B. Provide an auxiliary drain pan with liquid-tight seams for each air handler.
- C. Auxiliary drain pan shall be fitted with a normally-closed float switch which shall disable the heat pump in the event of high water in the pan or a 1" PVC pipe to discharge at a conspicuous location acceptable to the Building Official.

3.03 PAINTING:

- A. Equipment and items with a factory applied finish shall have scratches, chips, etc., primed and touched up with paint to match color of equipment and/or items installed.

3.04 CLEANING AND ADJUSTMENTS:

- A. Upon completion of work, clean, oil, and grease all fans, motors, other running equipment and apparatus and make certain that all such apparatus and mechanisms are in proper working order and made ready for tests.

3.05 TESTS:

- A. Balance all supply direct/diffuser systems and provide complete air balance report to Engineer prior to requesting final inspection. Report shall be signed by a principal of the mechanical contracting firm.

3.06 CUTTING OF STRUCTURE:

- A. Where it is required to cut any part of the structure for installation of equipment, the cutting shall be under the direction of the General Contractor.

3.07 ELECTRICAL:

- A. All electrical work and materials shall conform to the requirements of Section 15010.
 - 1. Split-System Air Handler (Indoor Unit): Indoor unit and auxiliary strip heater shall be provided and installed as part of the work. Indoor unit and strip heater shall be furnished with all operating and safety controls. Provide and install all controls, control wiring, conduit, etc., and make connections required for complete installation as part of the work.
 - 2. Split-System Heat Pump (Outdoor Unit): Outdoor unit shall be provided and installed as part of the work. The unit shall be provided with all operating and safety controls, conduit, wire, and shall be connected electrically from load side of disconnect to outdoor unit. Power wiring, including service disconnect, shall be provided as part of Division 16 work. This Section shall also provide and install all the necessary controls, control wiring and conduit.

END OF SECTION

SECTION 15896

FANS

PART 1 GENERAL

1.01 SCOPE:

- A. Ventilating fans shall be of the size, type, arrangement, construction, performance accessories and electrical characteristics specified hereinafter and/or indicated on the drawings. Fans equivalent to the specific manufacturer's model scheduled as a guide and complying with all other express requirements are acceptable.

PART 2 PRODUCTS

2.01 CENTRIFUGAL CEILING FANS:

- A. Shall have AMCA Certified Rating Seal, vibration proof grille and integral chatterproof backdraft damper. Provide wall caps and/or other accessories specified on the drawings. Fans shall be propeller or centrifugal type with permanently lubricated motor and built-in disconnect switch.

PART 3 EXECUTION

3.01 INSTALLATION:

- A. Install fans per manufacturer's written instructions.

END OF SECTION

SECTION 15990

TESTING AND BALANCING AIR SYSTEMS

PART 1 GENERAL

1.01 SCOPE:

- A. The Mechanical Contractor shall employ a testing and balancing firm specializing in total system testing and balancing. The balancing firm shall provide all labor, equipment, engineering and test equipment required to test, adjust, and balance all heating, ventilating, air-conditioning, and exhaust systems as hereinafter specified.

PART 2 PRODUCTS AND EXECUTION

2.01 BALANCING CONTRACT: Shall incorporate the following:

- A. Adjust and balance the complete mechanical system, including energy recovery ventilator.
- B. Upon completion of the air handling systems, the Contractor shall have an air balancing firm perform the following tests and compile the following information for each item of equipment and submit four (4) bound copies of this information to the Architect for approval.
- C. Install, at each piece of mechanical equipment, a "Data Register" showing all significant operating temperatures, pressures, amperes, voltage, brake horsepower, etc. "Data Register" to be enclosed in a vinyl film holder securely attached to the equipment or wall in immediate area after balance reports have been accepted.
- D. All test equipment will be furnished by the Balancing Contractor and will remain his property. All instruments will have been calibrated recently.
- E. The Balancing Firm shall warrant solely that the system will be set to within 10% of the values as established by the plans and specifications, and also adjust to minimize drafts in all areas.
- F. Any changes that are required for the final balancing results as determined by the Balancing Contractor will be provided by the respective Contractors who are to supply and install such equipment under their contractual obligations. Such changes may encompass, but are not necessarily restricted to, the changing of pulleys, belts, dampers, or adding dampers or access panels.

2.02 BALANCING PROCEDURE:

- A. Before starting air balance, check the following items:

1. Check air filters to be sure they are clean and in position.
 2. Check for proper belt tension and alignment.
 3. Check fan and motor lubrication.
 4. Check motor overload protectors or heaters for proper size.
 5. Check for proper rotation.
- B. Measure supply air volumes by means of the duct traverse method, taking a minimum of sixteen (16) readings. Seal duct access holes in metal ducts with metal snap-in-plugs. The use of duct tape to seal access holes will not be permitted.
- C. Adjust balancing dampers for required branch duct air quantities. Dampers shall be permanently marked after air balance is complete.
- D. Adjust grilles and diffusers to within 10% of individual requirements specified, and also adjust so as to minimize drafts in all areas.
- E. The total air delivery in any particular fan system shall be obtained by adjustment of the particular fan speed.
- F. The drive motor of each fan shall not be loaded over the corrected full load amperage rating of the motor involved.
- G. All duct systems are to be balanced for lowest static pressure and lowest fan speed possible to deliver required air quantity.
- H. Unless otherwise noted, adjust quantity of return air from space to pass 90% of air supplied to space.
- I. Where splitter and volume dampers have been provided for balancing of air in ducts, balancing shall be done with register and diffuser volume dampers as fully open as possible.
- J. Do not operate fans during times when construction process or clearing would allow dirt or rubbish to accumulate in the system.

2.03 CERTIFICATION:

- A. Furnish to the Architect/Engineer four (4) copies of the following data, signed by an authorized representative.
1. Room
 2. Supply or return size
 3. Design CFM

4. Measured CFM
5. Percent of Design CFM.

2.04 FINAL AIR BALANCE:

- A. Perform final air balance after building is occupied. On final air balance adjust air quantities as required to maintain space temperatures in building at 78°F plus or minus 2°. Submit data sheets on recorded temperatures. Indicate time of day and outdoor temperature on data sheets.

END OF SECTION

SECTION 16010 – ELECTRICAL GENERAL PROVISIONS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, General Conditions of the contract for Construction, AIA A201, 2007 Edition, apply to work of this Section and all subsequent Division 16 Sections.

1.2 WORK INCLUDED

- A. The work covered by this Division of the specifications consists of furnishing all material and labor, equipment and supplies, and performing all operations including cutting, channeling, chasing, excavating and backfilling necessary for the installation of complete wiring systems and electrical equipment, in accordance with this Division of the specifications and the accompanying drawings.
- B. Included are systems for lighting, power, connections to equipment furnished by others, telephone, fire alarm, and others as indicated.
- C. The work shall be coordinated with the work of other trades to insure correct location and installation of the building components and equipment required by all trades for electrical service.
- D. Prior to bidding the work, the Contractor shall examine all sections of the Specifications and the complete set of Contract Documents and bring to the attention of the Architect and Engineer any omissions, conflicts, or concerns effecting this Division of the work.

1.3 DRAWINGS

- A. The drawings and specifications are complimentary to one another and what is called for by one shall be as binding as if called for by both.
- B. Drawings indicate generally the location of equipment and are to be followed as closely as possible. If due to job conditions it is found necessary to change the location of equipment, such changes shall be made without additional cost to the Owner and as approved by the Engineer.
- C. Verify final rough-in locations with field measurements and the requirements of the specific equipment to be connected.
- D. Refer to equipment specifications in all other sections for rough-in requirements.

1.4 REQUIREMENTS OF REGULATORY AGENCIES

- A. Execute and inspect all work in accordance with Underwriters Laboratories (UL), and all local and state codes, rules and regulations applicable to the trade affected as a minimum. If the plans and/or specifications call for requirements that exceed these rules and regulations, the more stringent requirement shall be followed. Follow applicable sections and requirements and testing procedures of NFPA, IEEE, NEMA, CBM, ANSI, NECA, ICEA and NETA.

- B. The Contractor shall be responsible for the proper selection and application of materials and the methods of their installation. All materials and equipment shall be UL Listed and Labeled and be installed as specified in the latest edition of the "Electrical Construction Materials Directory."
- C. The Contractor shall include all work necessary, whether or not indicated in the Construction Documents, to comply with all local and state codes, ordinances, rules and regulations applicable without additional cost to the Owner.

1.5 PERMITS AND FEES

- A. The Contractor shall arrange for and pay for all inspections, licenses and certificates required in connection with the work.

1.6 TEMPORARY FACILITIES

- A. Light, Heat, Power, Etc.: Responsibility for providing temporary electricity, heat, and other facilities shall be as specified in Division 1.
- B. Building distribution equipment and devices may only be used with written permission from the Owner. If used for temporary power, the equipment shall be properly maintained and the Contractor shall repair any damage resulting from use. The guarantee period for new equipment shall not begin until the equipment is turned over to the Owner.

1.7 ACCESSIBILITY

- A. Install equipment and materials to provide required code clearances and access for servicing and maintenance. Coordinate the final locations with piping, ducts, and equipment of other trades to ensure proper access for all trades. Coordinate locations of concealed equipment, disconnect switches, and enclosure boxes with access panels and doors. Allow adequate space for removal of parts, fuses, lamps, etc. that require replacement or servicing.
- B. Extend all conduits such that junction boxes and pull boxes are in accessible locations.
- C. Install access panels or doors where equipment or boxes are concealed behind finished surfaces.

1.8 EXISTING CONDITIONS

- A. The Contractor shall visit job site and verify all conditions and dimensions. No extra payment shall be approved for unforeseen items.

1.9 SHOP DRAWINGS

- A. Before starting work, prepare and submit to the Engineer for review six sets of all major items of equipment. A cover sheet shall be included, listing manufacturer and model number of each item submitted. Continue to submit for the Engineer's review until a REVIEWED or MAKE CORRECTIONS NOTED action is received. Provide submittals for the following:
 - 1. Raceways & Fittings
 - 2. Supports
 - 3. Conductors & Cables
 - 4. Outlet Boxes

5. Floor Boxes
6. Wiring Devices
7. Distribution Equipment
8. Safety Switches
9. Surge Protection Device
10. Light Fixtures, Lamps & Ballasts
11. Grounding
12. Firestop
13. Fire Alarm System
14. Any items noted on the drawings.

- B. Recognize the purpose of shop drawings and other submittals is to inform the Engineer about equipment the Contractor proposes to furnish and install. Reviewed submittals are not change orders and do not give the Contractor authorization to deviate from the specification or the bid price for the project.

1.10 SUBSTITUTIONS AND APPROVALS

- A. Bids for work covered under this section of the specifications shall be based on the layout and equipment exactly as shown and specified. If the Contractor wishes to bid an alternate item, a request shall be submitted in writing in accordance with the General Conditions indicating such substitutions within the specified period prior to bid opening. Such requests shall be accompanied by sufficient catalog data upon which a decision may be based. Refer to Division 1 for all required submittal procedures and formats.
- B. The burden of proof that proposed equipment is equal or superior to that specified shall be on the Contractor. Substituted equipment shall only be allowed where specifically listed by written addendum. If substitutions are not granted, the specified materials and equipment shall be installed. Where substituted equipment is allowed, it shall be the Contractor's responsibility to notify all related or affected trades of the accepted substitution and to assume full responsibility for any costs caused as a result of the substitution.
- C. Unless otherwise specified, all materials and equipment shall be of domestic (USA) manufacturer.

1.11 PRODUCT LISTINGS

- A. When two or more items of same material or equipment are required they shall be of the same manufacturer. Product manufacturer uniformity does not apply to raw materials, sheet metal, steel bar stock, welding rods, solder, fasteners, and similar items used in work, except as otherwise indicated.
- B. Provide products that are compatible within systems and other connected items.

1.12 NAMEPLATE DATA

- A. Provide equipment having a permanently mounted, operational data nameplate indicating manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliance, and similar essential data. Install equipment such that nameplate is readily accessible.

1.13 DELIVERY, STORAGE, AND HANDLING

- A. Refer to Division 1, sections on Transportation & Handling, and Storage & Protection.
- B. Deliver products to project site properly identified with names, model numbers, types, grades, compliance labels, and similar information needed for distinct identification; adequately packaged and protected to prevent damage during shipment, storage, and handling.
- C. Store equipment and materials at the site, unless off-site storage is authorized in writing. Protect stored equipment and materials from damage and weather.
- D. Coordinate deliveries of electrical materials and equipment to minimize construction site congestion. Limit each shipment of materials and equipment to the items and quantities needed for the smooth and efficient flow of installation.

1.14 COORDINATION

- A. Coordinate chases, slots, inserts, sleeves, and openings with general construction work and arrange in building structure during progress of construction to facilitate the electrical installation that follow.
 - 1. Set inserts and sleeves in poured-in-place concrete, masonry work, and other structural components as they are constructed.
- B. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the work. Coordinate installing large equipment requiring positioning before closing in the building.
- C. Coordinate electrical service connections to components furnished by utility companies.
 - 1. Coordinate installation and connection of exterior underground and overhead utilities and services, including provision for electricity-metering components.
 - 2. Comply with requirements of Authorities Having Jurisdiction and of the utility company providing electrical power and other services.
- D. Coordinate location of access panels and doors for electrical items that are concealed by finished surfaces.

1.15 RECORD DOCUMENTS

- A. During construction, the Contractor shall make a record of all changes, in erasable pencil, made to the Contract Documents, including accurate dimensions, where applicable, and shall record accurate dimensions locating all below-grade outside electrical utilities with reference to permanent above grade objects. This set of documents shall remain on the job site and be

updated weekly.

- B. Upon project completion, all changes noted in above shall be recorded neatly, with red ink, by the Contractor on an unused set of Contract Documents and submitted to the Architect. This project shall not be considered complete until the updated record documents have been received and reviewed by the Engineer. The reviewed Project Record Documents shall then be returned to the Architect.

1.16 OPERATION AND MAINTENANCE DATA

- A. Refer to Division 1, section on Project Closeout or Operation and Maintenance Data for procedures and requirements for preparation and submittal of maintenance manuals.
- B. In addition to the information required by Division 1 for Maintenance Data, include the following information:
 - 1. Description of function, normal operating characteristics and limitations, fuse curves, engineering data and tests, and complete nomenclature and commercial numbers of all replaceable parts.
 - 2. Manufacturer's printed operating procedures to include start-up, break-in, routine and normal operating instructions; regulation, control, stopping, shutdown, emergency instructions, and summer/winter operating instructions.
 - 3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
 - 4. Servicing instructions, lubrication charts and schedules.
 - 5. Complete list of parts and wiring diagrams.
 - 6. Name, address and telephone numbers of the Contractor, Sub-contractors and local company responsible for maintenance of each system or piece of equipment.
 - 7. All information shall be permanently bound in a 3-ring binder. The job name & address and Contractor's name & address shall be permanently placed on both the cover and spine of each binder. Dymo-tape is not acceptable.
 - 8. Copies of all test reports shall be included in the manuals.
 - a. This contract will not be considered complete nor will final payment be made until all specified materials, including test reports, have been provided and the Architect/Engineer has reviewed the manual.

1.17 WARRANTIES

- A. Refer to Division 1, section on Warranties and Bonds for Procedures and Submittal Requirements for Warranties. Refer to individual equipment specifications for warranty requirements. In no case shall the warranty for the total electrical system be less than one year from date of acceptance by the Owner.
- B. The Contractor shall furnish a written guarantee to the Owner covering a period of one year from the date of final acceptance of the installation. The guarantee shall cover materials and workmanship, and any omission or defects that may arise or be discovered during the period and shall be corrected in a manner that is acceptable to the Owner at no additional expense.
- C. Provide complete standard warranty information for each item. Information shall include product or equipment description, beginning date of warranty or bond; duration of warranty or bond; and

names, addresses, telephone numbers and procedures for filing a claim and obtaining warranty services.

1. Compile and assemble the warranties specified in Division 16 and include in Operation and Maintenance Manuals, tabulated and indexed for easy reference.
2. Post the following warranty information on equipment: Length of warranty, installation date, Manufacturer's and Installer's contact information.

END OF SECTION 16010

SECTION 16015 – SEISMIC PROTECTION FOR ELECTRICAL CONDUIT AND EQUIPMENT

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, General Conditions of the contract for Construction, AIA A201, 2007 Edition, apply to work of this Section and all subsequent Division 16 Sections.

1.2 GENERAL

- A. The Contractor shall install all electrical equipment in accordance with the design detail provided by a Seismic Engineer. The Engineer shall be registered, shall be experienced in the design of site-specific seismic protection of electrical equipment and devices and shall be employed by and responsible to the Electrical Sub-contractor.

END OF SECTION 16015

SECTION 16100 – BASIC MATERIALS AND METHODS

PART 1 – GENERAL

1.1 MATERIALS

- A. Except where noted otherwise, materials shall be new and as specified and shall not be substituted unless authority is obtained from the Architect or Engineer. All material shall be Underwriters approved and bear the UL label. The materials shall be standard products of an established manufacturing firm regularly engaged in the manufacture of such materials, and shall be the manufacturer's latest design unless distinctly specified to the contrary. All items of the same type shall be identical products of the same manufacturer.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Protection: Materials and equipment shall be delivered to the job in the manufacturer's standard cartons, packages, and bundles, and shall be labeled to show the manufacturer's name, product, etc., on each item. Materials such as fixtures, lamps, panelboards, etc., shall be stored within a weatherproof building or other approved enclosure. Conduit, underground wiring, and similar materials shall be stacked 8" above the ground. All materials shall be protected from damage due to traffic on and about the job prior to, during, and after installation within the building structures, until the final acceptance of the work. Damaged materials and equipment shall be promptly removed from the premises and replaced with acceptable materials and equipment, without cost to the Owner.

1.2 COORDINATION

- A. Coordinate size and location of concrete bases for floor mounted distribution equipment. Cast anchor-bolt inserts into bases.

PART 2 – PRODUCTS

2.1 RACEWAYS AND FITTINGS

- A. All conductors and cables shall be installed in raceways. Metal clad cables (Type MC) are not acceptable, except as whips to lighting fixtures and then not to exceed 6 feet in length.
- B. All raceways in solid masonry construction or in wet areas shall be rigid metal conduit, made from mild steel, hot-dipped galvanized pipe conforming to ANSI C80.1 and UL 6.
- C. All exposed raceways below 6 feet above finished floor and subject to severe physical damage shall be rigid galvanized steel conduit.
- D. All raceways except as noted above shall be rigid metal conduit or electrical metallic tubing (EMT), which shall be galvanized steel conforming to ANSI C80.3 and UL 797.
- E. Conduit run in earth shall be plastic coated or shall be painted with two coats of asphaltic paint conforming to NEMA RN 1. Fittings for coated conduit shall be plastic coated or wrapped with

two layers of vinyl electrical tape. Non-metallic conduit conforming to NEMA TC 2 is acceptable if a transition is made to the aforementioned protected metallic conduit where it leaves or enters the earth.

1. Underground, Concrete Encased: Type EB-20 RNC. Use a minimum of five feet of PVC coated rigid metal conduit at foundation penetrations.
 2. Underground, Not Concrete Encased: Schedule 40 PVC or Schedule 80 conduit. Use a minimum of five feet of PVC coated rigid metal conduit at foundation penetrations.
- F. All raceways for connection to vibrating equipment or freestanding equipment, including flow and tamper switches, transformers, and hydraulic, pneumatic, electric solenoid, or motor-driven equipment shall be flexible metal conduit (FMC) in dry locations in compliance with UL 1 and liquid-tight flexible metal conduit (LFMC) in damp and wet locations per UL 360.
- G. Surface metal raceways shall be furnished where indicated, and may be utilized in other areas upon specific approval of the Architect. Raceways shall be galvanized steel with snap-on covers. The cover shall be assembled to the base with a locking hinge. The base of the raceway shall have removable barriers to separate channels. The raceway and all components must comply with UL 94VO and be UL listed. Raceways shall be painted to match walls and/or bases, and colors shall be approved by the Architect. Raceways to be field-painted shall be furnished with a prime coat.
- H. Minimum raceway size: Conduit sizes shall be as shown on the drawings. If the conduit size is not given on the drawings, the conduit shall be sized in accordance with NEC Appendix C Tables based on the number of conductors enclosed plus a parity sized equipment ground conductor and be subject to the following minimum sizes:
1. Rigid and EMT Conduit: All homeruns shall be 3/4-inch minimum.
 2. Flexible and Liquid-tight Flexible Conduit: All homeruns shall be 1/2-inch minimum.
 3. Conduits used for home runs shall contain no more than three current carrying conductors for the circuits indicated on the drawings. Combining multiple home runs into a single conduit shall not be permitted unless otherwise noted.
- I. Fittings:
1. Fittings for rigid conduit and EMT shall conform to ANSI C80.4. EMT fittings shall be interlocking, steel compression type, moisture proof. Terminal fittings shall have insulated throat.
 2. Fittings for flexible conduit shall be liquid-tight fittings as O-Z Gedney Series 4Q, or Thomas & Betts Series 5300 with insulated throats.

2.2 SUPPORTS

- A. Hangers shall be galvanized malleable iron one-hole type straps for single conduit and trapeze type for multiple conduits.

2.3 CONDUCTORS AND CABLES

- A. Building wires shall be thermoplastic insulated conductors per UL 83 and be manufactured to meet the standards of Insulated Cable Engineer's Association (ICEA).

- B. Branch circuit feeders whose length from panel to first outlet exceeds 100 feet for 120 volt circuits or 220 feet for 277 volt circuit shall be No. 10 or larger, as required by NEC.
- C. No. 10 AWG and smaller branch circuits shall be solid conductor, Type THWN, THW or TW, except for motor circuits.
- D. No. 8 AWG and larger branch circuits shall be stranded conductor, Type THWN or THW.
- E. Underground service entrance and underground feeders shall be 75 degree C, Type USE-RHH-RHW-THW-THWN insulation.
- F. Fixture wire shall have a maximum operating temperature of 150 degree C at 600 volts nominal: Type AF insulation for 120 volt or Type SF-2 insulation for 277 volt.
- G. All conductors shall be sized on the basis of the UL rated temperature ampacity for the equipment or device to which they are connected.
- H. All conductors shall be copper. No conductor smaller than No. 12 AWG shall be installed unless otherwise noted.
- I. All exposed conductors below 6'-0" AFF and subject to severe physical damage shall be run in rigid galvanized steel conduit.
- J. Conductor connectors shall be the spliced type for No. 10 and smaller wire and shall be made with approved solderless device such as wing nut connectors as made by Ideal Industries. Spliced connections for wires No. 8 and larger shall be made with approved solderless compression-type connectors and insulation tape per UL 510.

2.4 OUTLET BOXES

- A. Boxes, extensions and rings shall be sheradized or galvanized, shall comply with UL 514, and shall be of the depth necessary to finish flush with the wall or ceiling surface. Boxes shall be code gage sheet steel at interior dry locations and cast metal with gasketed cover at damp or wet locations. Provide a grounding terminal in the interior of the box when wiring to an item that includes a grounding conductor.
- B. All boxes shall be sized in strict accordance with the National Electrical Code (NEC), Article No. 314, except that no box will be less than the minimum specified.
- C. Wall boxes for switches and receptacles shall not be less than 1-1/2 inches deep and of one piece construction, unless noted otherwise. Boxes shall be arranged with knockouts of the size required to receive the raceway fittings.
- D. Boxes shall have lugs or ears to secure covers or plaster rings.
- E. Ceiling boxes shall be 4 inches square x 1-1/2 inches minimum or 4 inches octagonal x 1-1/2 inches minimum.
- F. Boxes for lighting fixtures shall have studs where required by fixture design.
- G. Boxes shall be ganged where two or more devices occur at same location.

- H. For boxes in main feeder conduit runs, use sizes not smaller than 8-inches square by 4-inches deep. Do not exceed six entering and six exiting raceways in a single box

2.5 WIRING DEVICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following: Cooper, Watt Stopper, Hubbell, Leviton, Lutron, Pass & Seymour and Sensor Switch.
- B. Snap switches shall be commercial specification grade, AC quiet type, grounding (screw) type, back- or side-wired, rated at 20 amperes at 125/277V AC with toggle handle, as specified below, unless otherwise specified elsewhere or shown on the drawings:
- Cooper CS120 – single-pole.
 - Cooper CS320 – three-way.
 - Cooper CS420 – four-way.
- C. Dimmer switches shall be commercial specification grade with on/off toggle handle and slider. Fluorescent dimmer switches shall be compatible with dimming ballasts. Switches shall be as specified below, unless otherwise specified elsewhere or shown on the drawings:
- Pass & Seymour CD703P, CD1103P, CD1603P & CD2003P – 700, 1100, 1600 & 2000-watt incandescent dimmers respectively.
 - Pass & Seymour CD3FB163P – 120V, 16A, 3-wire fluorescent dimmer.
 - Pass & Seymour CD3FB103P277 – 277V, 10A, 3-wire fluorescent dimmer.
- D. Automatic switches (occupancy sensor) shall be commercial specification grade, dual technology, 180-degree coverage, line voltage, light level sensor, walk-through mode with manual override button(s) and choice of Auto-On or Manual-On operation. Switches shall be as specified below, unless otherwise specified elsewhere or shown on the drawings:
- Watt Stopper DW-100 – single relay.
 - Watt Stopper DW-103 – single relay, multi-way.
 - Watt Stopper DW-200 – dual relay.
 - Watt Stopper DW-203 – dual relay, multi-way.
 - Watt Stopper TS-400 – digital timer (Time-out adjustment set to 15 minutes).
- E. Ceiling mounted occupancy sensor shall be commercial specification grade, dual technology, 360-degree coverage, low voltage with power pack, light level sensor, walk-through mode and choice of Auto-On or Manual-On operation. Sensor shall be as specified below, unless otherwise specified elsewhere or shown on the drawings:
- Watt Stopper DT-300.
- F. Where shown near doors, wall switches shall be mounted not less than 2 inches nor more than 12 inches from trim, except where double doors are shown install switches 2 to 12 inches beyond door swing.
- G. Duplex receptacles shall be commercial specification grade, straight blade, back- or side-wired, rated 20 amperes at 125 volts, NEMA 5-20R, as specified below, unless otherwise specified elsewhere or shown on the drawings:

- Cooper BR20 – duplex receptacle.
 - Cooper VGF20 – GFCI duplex receptacle, non-feed-through type (interior locations).
 - Cooper WRVGF20 – GFCI duplex receptacle, non-feed-through, weather-resistant type (damp or wet locations).
 - Cooper 1210 – TVSS duplex receptacle, integral. Cooper 1209 – Provide six spare replacement modules.
- H. Weatherproof duplex receptacles shall be weather-resistant type duplex receptacle, as specified above, with GFCI feature installed in Appleton or Crouse-Hinds type FS cast box with weatherproof cover and gasket or equal combination, unless otherwise specified elsewhere or shown on the drawings.
- Cooper 966 – wet location, self-closing lid.
- I. Where weatherproof outlets may be utilized continuously or are in “wet” locations, shall conform to the requirements for weatherproof receptacles and shall be installed with a hinged outlet cover/enclosure clearly marked “Suitable For Wet Locations While In Use” and “UL Listed.” There must be a gasket between the enclosure and the mounting surface, and between the hinged cover mounting plate/base to assure proper seal, unless otherwise specified elsewhere or shown on the drawings.
- Cooper WIU-1 – while-in-use cover.
- J. Special receptacles shall be as shown on the drawings. Single outlets shall be Cooper, Hubbell, Bryant, Leviton or equal of voltage and ampere rating indicated by NEMA configuration.
- K. Finish: Wiring devices shall be colors indicated below unless otherwise indicated or required by NFPA 70.

| <u>System or Type</u> | <u>Color</u> |
|------------------------------|-----------------------------------|
| Normal Power System | White or as selected by Architect |
| Emergency Power System: | Red |
| TVSS Devices: | Blue |
| Isolated Ground Receptacles: | Orange |
| Specific-Use Device: | Black |

- L. Wiring Device Cover Plates:
1. Plates for switches and receptacles shall be ganged where indicated at same location.
 2. All device boxes installed for future wiring shall have blank plates.
 3. Cover plates shall be jumbo size, single and combination type to match corresponding devices, 0.04-inch thick, smooth high-impact thermoplastic with metal screws and shall be Type 302 stainless steel or as selected by Architect.
 4. Cover plates for exterior receptacles in damp or wet locations shall comply with NEC Article No. 406.8 and 20 ampere 120 volt receptacles shall be UL listed with plug cap inserted in receptacle.

2.6 DISTRIBUTION EQUIPMENT

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following: Square D, General Electric Co., or Eaton Corporation; Cutler-Hammer Products.

- B. Furnish and install circuit breaker panelboards as indicated in the panelboard schedule and where shown on the plans. Panelboards shall be cabinet enclosures, dead front safety type with hard-drawn copper, 98% conductivity phase and ground bus and equipped with thermal-magnetic molded case circuit breakers of frame and trip ratings as shown on the schedule. Panelboards shall conform to UL 67 and UL 50.
- C. All panel boards, switches, fuses and circuit breakers shall be capable of withstanding and/or interrupting the short circuit current available at the device's terminals. The contractor shall contact the supplying utility for the exact available short circuit current.
- D. Circuit breakers shall be quick-make, quick-break, thermal-magnetic trip indicating, and have common trip on all multi-pole breakers. Trip indication shall be clearly shown by the breaker handle taking a position between ON and OFF position when the breaker is tripped. Branch circuit breakers feeding convenience outlets shall have sensitive instantaneous trip setting of not more than 10 times the trip rating of the breaker in order to give "flash protection" for frayed stranded wire cords. All connections to the bus shall be bolted.
- E. Bus bar connections to the branch circuit breakers shall be the "distributed phase" or "phase sequence" type. Three phase, 4-wire panelboard bussing shall be such that any two adjacent single-pole breakers are connected to different polarities and in such a manner that 2-pole and 3-pole breakers can be installed in any location. Similarly, 1-pole and 2-pole breakers can be installed in any location in single phase, 3-wire panelboards and load centers. Each panelboard shall have an insulated neutral bus and appropriate connectors for feeder and branch circuits. Each panelboard shall have a separate equipment grounding bus with appropriate connectors/terminals for all feeders and branch circuits. The equipment ground bus shall be bonded to the neutral bus only at the main service disconnect. The cabinet shall be bonded to the equipment ground bus with the conductor sized per Table 250.122 of the NEC. Service main ratings shall be as shown in the panelboard schedule on the drawings.
- F. Panelboard terminals for main and branch circuit wiring, both breaker and neutral, shall be UL listed as suitable for the type of conductor specified.
- G. Panelboard circuit breaker position numbering shall be such that starting at the top, odd numbers shall be used in sequence down the left-hand side and even numbers shall be used in sequence down the right-hand side.
- H. The panelboard bus assembly shall be enclosed in a steel cabinet. The size of the wiring gutters and gage of steel shall be in accordance with NEMA PB1 and UL 67 for panelboards. The enclosure shall be fabricated from galvanized steel or equivalent rust resistant steel. Fronts shall include door and have flush, brushed stainless steel, cylinder tumbler-type locks with catches and spring-loaded door pulls. The flush lock shall not protrude beyond the front of the door. All panelboard locks shall be keyed alike. Fronts shall have adjustable indicating trim clamps which shall be completely concealed when the doors are closed. Doors shall be mounted by completely concealed steel hinges. Fronts shall not be removable with door in the locked position. A circuit directory frame and card with a clear plastic covering shall be provided on the inside of the door. The directory card shall provide a sufficient space for each circuit. The directory shall be typed to identify the load fed by each circuit and shall reflect all revisions that may have occurred during construction.
- I. Molded case circuit breakers shall comply with NEMA AB1. Circuit breaker types shall be UL listed and rated for the load being fed.

1. HACR: Air conditioning equipment.
2. Arc Fault Circuit Interrupting (AFCI): Lighting and power circuits in bedrooms.
3. HID: Fluorescent and high intensity discharge light being switched at the circuit breaker.

2.7 SAFETY SWITCHES

- A. Manufacturers: Shall be of same manufacturer as Distribution Equipment.
- B. Safety switches shall be fully enclosed, general duty, 240 or 600 volt, as indicated. Enclosure shall be metallic, general purpose for interior locations and rain-tight, NEMA 3R, with rain-tight hubs for exterior locations. Provide solid insulated neutral bus where required by the equipment. All switches shall include an equipment ground lug. Switches shall be non-fused, unless otherwise indicated. Fused switches, where indicated on drawings, shall be fitted with dual element, time delay, non-renewable fuses. Provide a spare set of fuses for each fused switch.

2.8 LIGHT FIXTURES

- A. Light fixtures shall conform to the UL Standard for light fixtures, Publication No. 57, and shall be complete with lamps, lens, diffusers, canopies, and all necessary accessories, fittings, and mounting hardware. Light fixtures shall be surface-mounted, semi-recessed, or recessed type as indicated in the fixture schedule and shall be furnished with hangers, plaster rings, or other devices for a neatly finished installation. All fixtures shall be factory wired and assembled. The Contractor shall be responsible for ordering fixtures designed for installation with the ceiling indicated for the various spaces. Recessed fixtures in fire-rated assemblies shall be provided in compliance with the respective UL design assembly regulations.
- B. Incandescent fixtures shall not be permitted, unless otherwise indicated.
- C. Ballasts: All fluorescent fixtures shall be equipped with CBM certified premium Class P, Class A sound rated, energy saving high power factor electronic ballast with normal ballast factor for the voltage indicated. Total harmonic distortion shall not exceed 10% of fundamental. Ballasts must meet FCC rules and regulations Part 18, 15J for EMI and RFI. Power Factor must exceed 98%, Normal Ballast Factor range shall be between 0.85 and 1.00, and Crest Factor must not exceed 1.7. Ballast case temperature shall not exceed 90 degree C when fixture is operated at normal room temperature of 77 degree F. All ballasts must meet all requirements of ANSI C82.11.
 1. Acceptable manufacturers: Advance, Osram-Sylvania, GE, Bodine, or Iota.
 2. Remote ballasts shall be mounted per manufacturer's recommendation and shall be accessible.
- D. Lamps shall be of wattage specified on the fixture schedule. Fluorescent lamps shall be bi-pin type using low-energy cool white (4100 degree K) tubes. Incandescent lamps shall be as called for on the drawings and for 125-130 volts.
 1. Acceptable manufacturers: Phillips, Osram-Sylvania, or GE.
- E. Ballast and Lamps shall be compatible.
- F. See drawings for Light Fixture Schedule.

2.9 GROUNDING

- A. Grounding will be required for all feeders and branch circuits using green insulated ground conductor run with the hot and neutral conductors. Size equipment ground wires per Table 250.122 of the NEC. Bond motors and all non-current carrying metallic parts of electrical equipment, devices, light fixtures, raceways, cable tray, etc. per the NEC.
- B. Grounding rods shall be a minimum of 3/4 inch in diameter x 10 feet long, sectional type, of copper clad steel with a copper wall thickness of not less than 0.013 inch. Connectors shall be solid copper or brass U-bolt clamps.
- C. Intersystem bonding termination shall be provided and shall include provisions for connecting at least three grounding or bonding conductors required for communications systems with a minimum 6 AWG copper conductor.
- D. Grounding Bus: Rectangular bars of annealed copper, 1/4 by 2 inches in cross section, unless otherwise indicated; with insulators. Provide where indicated on drawings.
- E. Connectors: Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.

2.10 FIRESTOPPING

- A. All conduits which pass through fire-rated assemblies, or are run inside fire-rated walls, floors or ceiling, shall be firestopped on both sides of the penetration in accordance with UL 1479 and ASTM E 814.
- B. Firestopping materials shall be as manufactured by 3M Company, CP-25 caulk, moldable putty, FS-195 strips, and CS-195 sheets, or equal by Dow-Corning or Hilti.

PART 3 – EXECUTION

3.1 GENERAL

- A. All work shall conform to the best recognized practices of the trade, employing the latest accepted techniques and using modern tools and equipment in accordance with requirements of safety rules and regulations. The work shall be performed by competent workmen, skillful and experienced in the particular type of work to be performed, and under the supervision of a competent and experienced foreman. Only qualified electricians shall be used for installation and wiring of panelboards, control devices, motors, and equipment. The Electrical Contractor shall consult with the General Contractor and other trades as necessary to determine exact requirements for installation of the equipment required by other trades. Before work commences, a coordination drawing shall be created which shall be reviewed with the construction superintendent to eliminate interference with building components and insure proper location of the various electrical devices. The location of outlet boxes shall be double checked with the construction superintendent immediately prior to placing concrete and wallboard.

3.2 RACEWAYS AND FITTINGS

- A. Install electrical raceways in accordance with manufacturer's written installation instructions and applicable requirements of the NEC.

- B. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated. Install concealed raceways parallel or at right angles to nearby surfaces or structural members with a minimum number of bends in the shortest practical distance, considering type of building construction and obstructions, unless otherwise indicated.
- C. Install exposed raceways parallel or at right angles to nearby surfaces or structural members and follow surface contours as much as possible.
 - 1. Run parallel or banked together on common supports.
 - 2. Make parallel bends in parallel or banked runs. Use factory elbows only where elbows can be installed parallel; otherwise provide field bends for parallel raceways.
- D. Raceways Embedded in Slabs: Install in middle 1/3 of slab thickness where practical and leave at least 2 inches of concrete cover.
 - 1. Secure raceways to reinforcing rods to prevent sagging or shifting during concrete placement.
 - 2. Space raceways laterally to prevent voids in concrete.
 - 3. Run conduit larger than 1-inch parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
 - 4. Change from nonmetallic raceway to plastic coated rigid metal conduit before rising above the floor.
- E. Make bends and offsets so inside diameter is not effectively reduced. Keep large bends in the same plane and keep straight legs of offsets parallel, unless otherwise indicated. Conduit larger than 1 1/4 inch: Bends shall be factory-made elbows, unless otherwise approved. Conduit 1 1/4 inch and smaller: Bends shall be made in approved bending machine or factory made. Hickey bends will not be permitted on conduits larger than 3/4 inch.
- F. Bends and offsets in each run of conduit shall be kept to the minimum. Where excessive bends are required, the size of the conduit will be larger in accordance with requirements of the NEC.
- G. Join raceways with fittings designed and approved for that purpose and make joints tight.
 - 1. Use insulating bushings to protect conductors when subject to vibration and dampness.
 - 2. To provide electrical continuity of the raceway system, fittings shall be mechanically tight or use bonding jumpers when joints cannot be made tight or subject to vibration.
 - 3. Terminal fittings at panelboards and outlet boxes shall have plastic throat bushings.
 - 4. Joints in non-metallic conduits shall be made with solvent cement in strict accordance with manufacturer's recommendations.
- H. Support raceways using strap hangers, beam clamps, or other approved devices to prevent vibration and excessive sagging between the supports. Vertical runs of conduit shall be securely supported with clamps or other devices at the lower end of each vertical run. Supports shall be adequate to support the weight of the conduit and enclosed conductors.
 - 1. Do not attach raceways to underside of metal roof decking. Raceways shall be routed a minimum of 3 inches below to avoid roofing nail penetrations.

- I. Complete raceway installation before starting conductor installation. Clean inside of raceways before installing conductors. Provide temporary plugs in open ends of all conduit during the construction period to prevent entrance of foreign matter.
- J. Keep raceways at least 12 inches away from parallel runs of heated piping for other utility systems.
- K. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.
- L. Ream raceways and butt ends into couplings; all threaded joints shall be made tight. Install raceways with no more than four quarter-bends per run maximum. Install no pull box in an inaccessible location. Fasten raceway to boxes with locknuts and bushings. Wherever threads are left exposed or where protective coatings have been removed during installation, provide two coats of galvanize-coating paint.
- M. Tables in Appendix C of latest NEC shall apply unless larger raceway specified.
- N. EMT shall be secured for grounding purposes by means of concrete-tight connections of the interlocking compression ring, or stainless steel multiple joint locking ring type. Set screws or indentation fittings shall not be acceptable. EMT 3/4 inch or larger shall be provided with insulated connectors.
- O. Flexible type conduit shall be used for a pigtail type connection between the rigidly mounted terminal outlet box and each lay-in light fixture and the final connection to vibrating equipment and freestanding equipment, including flow and tamper switches, transformers, and hydraulic, pneumatic, electric solenoid, or motor-driven equipment. Flexible conduit for outdoor equipment shall be liquid-tight type using moisture-proof fittings. Conduit length shall be no more than 36 inches. Install separate ground connector across flexible connections.
- P. Surface mounted conduit shall be painted to match walls with paint acceptable to Architect.
- Q. Conduit passing through concrete walls shall be fire-sealed.
- R. Sleeves: Install in concrete slabs and walls and all other fire-rated floors and walls for raceways and cable installations as required:
 - 1. Where sleeves through floors are installed, extend above finish floor.
 - 2. Where individual conduits penetrate fire-rated walls and floors, provide pipe sleeve one size larger than conduit; pack void around conduit with fire rated insulation and seal opening around conduit with UL-listed firestopping sealant. Conduits on trapeze type support system shall require fire taping only. See Architectural plans for location and extent of fire rated assemblies.
 - 3. Where conduits are to be installed through structural framing members, the contractor shall provide sleeves. For areas where sleeves have not been provided, the Architect's written approval must be obtained prior to cutting, notching or drilling of structural framing members.

3.3 CONDUCTORS AND CABLES

- A. Conductors shall not be installed in the raceway until the building is closed-in and dry. Before installation, the raceway shall be examined and all dirt and debris shall be removed by the use of swabs, vacuum cleaner, blower, or other devices. Conductors shall not be installed in conduit that has moisture accumulation. Special care shall be exercised during the 'pulling' of the conductors in raceway system to prevent damage to the conductor insulation. Lubricant shall be of a type that will not cause deterioration of the raceway or the conductor insulation. Conductors run in vertical raceways shall be supported per NEC Article No. 300.19.
- B. Conductors for branch lighting and appliance circuits shall be run as single phase, 2-wire except that a common neutral may be used for 2 or 3 circuits when each circuit is on a different phase (increase neutral by one size if non-linear load is on two or more circuits). A separate neutral will be required in all other cases.
- C. Splices shall be made only in accessible outlet or junction boxes.
- D. Conductor connections shall be made tight with screws set home to prevent loosening. Use insulated wire nuts for taps and splices in No. 10 and No. 12 gauge conductors. Split bolt connectors shall be used on No. 8 and larger size conductors. Uninsulated splice devices shall be covered with not less than 3 layers of rubber tape, and additionally with friction or plastic tape.
- E. Conductors at each outlet device shall have 8 inches long terminal leads to facilitate wiring device installation and shall be neatly curled into the box before installation of the device and cover. Conductors within panelboards and other equipment shall be neatly run to permit ease in tracing. Random type bird nest wiring will not be permitted.
- F. Wire markers shall be used to mark wires within panelboards corresponding to the circuit number and within outlet boxes where the same color is repeated for two or more circuits. Wire markers shall be Brady E-Z code or an approved equal.
- G. Conductors shall be color coded as follows:

240/120V., 3 PH.
 Phase A - Black
 Phase B - Red
 Phase C - Blue
 Neutral - White
 Ground - Green

3.4 OUTLET BOXES

- A. Outlet boxes shall be provided for all light fixtures, wiring devices, and equipment connections. Boxes shall be of size and type to properly accommodate the size and number of raceways entering the box and conductors.
- B. Attachment devices for outlet boxes shall be nails for wood construction and bolts, clamps or powder-actuated studs for masonry or light steel construction. Install in such a manner that will not cause structural damage to the structural members. Welding of boxes and conduit will not be permitted.
- C. Boxes for ceiling mounted light fixtures shall be securely mounted to the building structural members. Where light fixtures are to be supported directly from the outlet box, the box

anchorage shall be sufficiently rigid and strong to prevent movement of the box and fixture in the completed structure.

- D. Outlet boxes for surface-mounted light fixtures shall be set so that the face of the outlet box is flush with the finished ceiling or wall surfaces as applicable.
- E. Outlet boxes for lay-in light fixtures shall be mounted to the nearest structural member above the fixture location with fixture connection made using flexible conduit from outlet box to the light fixture.
- F. Outlet boxes in metal stud partitions shall be installed on bar hangers rigidly fastened to at least two studs.
- G. Outlet boxes for wall switches shall be mounted on the strike edge of the door, 48" above the floor. Where more than one switch is indicated as side-by-side, the box shall be of size to permit gang-mounting of all switches within a single box.
- H. Outlet boxes for wall switches shall be mounted on the strike edge of the door, 48" above the floor to center of box. Where more than one switch is indicated as side-by-side, the box shall be of size to permit gang-mounting of all switches within a single box.
- I. In cases where the finished wall is masonry construction, rough-in heights may be adjusted to suit the block course; outlets should occur at the top or bottom of the masonry units.
- J. Back to back outlet boxes are not permitted. Separate boxes a minimum of 6 inches in standard walls and 24 inches in acoustical walls.
- K. Cap unused knockout holes where blanks have been removed and plug unused conduit hubs.
- L. Protect outlet boxes to prevent entrance of plaster, and debris during construction. Thoroughly clean foreign material from boxes before conductors are installed.

3.5 WIRING DEVICES

- A. Install wall switches so that the load is off when the toggle is in the down position. Gang switches under common plate where two or more indicated at same locations. Mount switches at 48 inches above finished floor to center of the junction box.
- B. Install duplex receptacles in the vertical direction with the grounding terminal down, except where specifically otherwise indicated. Above counter duplex receptacles shall be mounted horizontally with the grounding terminal on the left.
- C. Special outlets shall be installed to suit the equipment served. Verify electrical requirements with the respective equipment manufacturer's approved shop drawings and coordinate with the installing contractor.
- D. Provide plaster rings when necessary to install cover plates flush with finished wall or ceiling surfaces.

- E. Locate automatic switches (occupancy sensors) per manufacturer's recommendations for proper operation and where there are no obstructions within coverage area. Coordinate with final furniture layout.
- F. When there are multiple occupancy sensors (wall and/or ceiling) within a single room, connect so that when one sensor is activated the entire space will illuminate unless otherwise indicated on the drawings

3.6 DISTRIBUTION EQUIPMENT

- A. Distribution equipment shall consist of power and lighting panelboards, safety switches, raceway, conductors, etc., as indicated on the drawings and as specified herein. Cabinets and other enclosures shall be anchored to the building structure. The entire installation shall be designed and installed to safely support the weight of the equipment, and shall be installed in a manner that will not damage the structure or interfere with the installation of the various electrical devices and equipment. Splice boxes shall be fitted with removable covers and shall conform to the requirements of the NEC for the task intended. All boxes and cabinets shall be neatly and accurately drilled, or punched, to receive the raceway fittings.
- B. Before installation of the electrical panels, the systems shall be planned and the exact location determined to eliminate interference with other building components. Panelboards shall be erected so that the top is not more than 7 feet 8 inches above the floor and with a minimum bottom clearance of 6 inches above the finished floor. Surface or recess mount as indicated on the drawings. Where wall thickness indicated on the drawings will not permit installation of the cabinet depth, the Architect shall be consulted for instructions. Surface mounted cabinets and switches shall be installed to permit opening of the doors and free and easy access to switch handles and other adjacent devices. Exposed conduit for panel feeders and branch circuits shall be arranged to obtain a neat installation and to permit finishing of the wall and ceiling surfaces in a workmanlike manner.
 - 1. Recessed mounted cabinets, provide a 1 inch spare conduit with pull string stubbed to above the accessible ceiling for every three spares or spaces.
- C. Label the front of each panelboard and switch to conform to the riser diagram or as specified. Label shall consist of an engraved plate punched or drilled for mechanical fasteners attached to the panel front. Letters shall be not less than 1" in height and of a contrasting color.
 - 1. Engraved legend with black letters on white face for normal.
 - 2. Engraved legend with white letters on green face for ground connections.
- D. Balance loads to within 10 percent on all phase buses in the distribution equipment.
- E. A sign stating DANGER ARC FLASH HAZARD in 3/4-inch high letters shall be permanently affixed to the front panel of all panelboards in accordance with NEC Article No. 110.16.
- F. The contractor shall verify power and circuit breaker requirements for mechanical equipment with the Mechanical Contractor prior to ordering distribution equipment and conduit and conductor rough-in. Report major discrepancies to the Engineer.
- G. Install floor-mounted distribution equipment on concrete bases.

3.7 LIGHT FIXTURES

- A. Light fixtures shall be installed per NEC Article No. 410, and as shown on the electrical drawings. Architectural reflected ceiling plans shall govern upon any light fixture location discrepancies.
- B. The Contractor shall consult with the Mechanical Contractor before installation of the duct work and the electrical work to eliminate conflicts between the two trades. Electrical fixtures shall not be relocated except when specifically approved by the Architect.
- C. Recessed light fixtures shall be installed flush, snugly fitted to the wall and ceiling surfaces, and shall be securely anchored in place with their weight independent of the ceiling. Lay-in light fixtures shall be suspended at all four corners from building structure using 12-gage galvanized steel wire. Light fixtures shall also be attached to ceiling grid with approved attachment clips. Diffusers and hinged frames shall be free from vibration.
- D. Ballasts causing excessive noise and flickering of the lamps shall be replaced and all fixtures shall be placed in operation complete with lamps before final acceptance.
- E. This Contractor shall provide support structure of Unistrut or Kindorf as required or shall support fixtures from building structural system with approved beam clamps or other devices.

3.8 EQUIPMENT CONNECTIONS

- A. The Contractor shall be required to make connections to equipment furnished and installed by other trades as indicated on the drawings. The Contractor shall furnish electrical service, including conductor and conduit, from panelboards to the equipment, terminating in an outlet box located adjacent to the equipment and securely anchored to the building structure. Final connection between the outlet box and the equipment shall be made using flexible conduit from the outlet to the junction box on the equipment. Motor starters or other type of control equipment furnished with equipment provided by other trades shall be installed and connected by the Contractor; connect power wiring to all equipment. The Contractor shall be responsible for actual wire connections at one point on packaged equipment only. Testing of the equipment shall be the responsibility of the installing trade. Where indicated, disconnect switches, fused or non-fused, shall be installed adjacent to the equipment location. Electrical equipment specified as a part of this section or furnished by other trades shall be completely installed and tested by the Contractor.
- B. The Contractor shall verify all Food Service Equipment power and receptacle requirements by reviewing cut sheets provided by the Owner/Contractor before rough-in. The Electrical Contractor shall also confirm power and receptacle requirements for medical or other equipment with the Contractor supplying that equipment prior to installation.

3.9 GROUNDING

- A. Grounding shall be as hereinbefore specified. Except where specifically indicated to the contrary, all exposed non-current carrying metal parts of electrical equipment, raceway system, and neutral conductor shall be grounded. Install grounding type bushing with jumper cables to panelboards and feeder raceway. Provide an equipment grounding conductor in all feeders and branch circuits sized per NEC Table 250.122. Flexible raceway shall have a green color grounding conductor run with the electrical phase conductors. Each item of prefabricated equipment and each electrical

motor shall be grounded with a green colored conductor connected to the grounding lug of the outlet box and to the grounding pole of the receptacles. Bond panelboards to incoming and outgoing feeder raceways with grounding-type bushings with jumper cable per NEC.

- B. Cable tray shall be grounded per paragraph 3.03.L.
- C. Intersystem bonding termination means shall be installed at one of the following specific locations per NEC Article No. 250.94:
 - 1. Meter socket enclosure.
 - 2. Service equipment enclosure.
 - 3. Grounding electrode conductor.

3.10 FIRESTOPPING

- A. Firestopping materials shall be applied per manufacturer's written instructions.
- B. Identification: Identify through-penetration firestop systems with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of edge of the firestop systems so that labels will be visible to anyone seeking to remove penetrating items or firestop systems. Use mechanical fasteners for metal labels. For plastic labels, use self-adhering type with adhesives capable of permanently bonding labels to surfaces on which labels are placed and, in combination with label material, will result in partial destruction of label if removal is attempted. Include the following information on labels:
 - 1. The words "Warning - Through-Penetration Firestop System - Do Not Disturb. Notify Building Management of Any Damage."
 - 2. Contractor's name, address, and phone number.
 - 3. Through-penetration firestop system designation of applicable testing and inspecting agency.
 - 4. Date of installation.
 - 5. Through-penetration firestop system manufacturer's name.
 - 6. Installer's name.

3.11 COMPLETION

- A. Final Adjustment: Final adjustment shall be made prior to the final inspection. The entire electrical system shall be checked and all defective lamps, switches, receptacles, and other items of equipment shall be replaced. Cover plates and lighting fixtures shall be checked and aligned. All panels shall be clearly labeled and the directory in each distribution panel shall be neatly typed to show the use of each circuit.
- B. Tests: Following completion of all wiring installations, test each system and eliminate any grounding of potential conductors, short circuits and other faults. Test all receptacles with a test instrument which tests for properly-wired phase, neutral, and ground connections. Defray cost for all adjustments necessary to bring system up to standards set forth by Contract Documents. All scheduled inspections shall be conducted by a principal of the Electrical Contracting Firm.
 - 1. Provide written reports to Owner and Engineer of tests and observations. Report defective materials and workmanship and unsatisfactory test results, and retest corrected defective items. Include records of repairs and adjustments made. Submit test reports to

Owner and Engineer for acceptance. Include test reports in Operation & Maintenance Manuals.

END OF SECTION 16100