

PROJECT MANUAL FOR:

**Hill Hall -
Building Envelope Repairs**

PROJECT NO.: CP220951

**AT:
UNIVERSITY OF MISSOURI - COLUMBIA
COLUMBIA, MISSOURI**

**FOR:
THE CURATORS OF THE
UNIVERSITY OF MISSOURI**

PREPARED BY:

PWARCHITECTS, INC.

**ATTN: ERIC ROSELLE, AIA
2120 FORUM BOULEVARD, SUITE 101
COLUMBIA, MISSOURI 65203
PHONE: (573) 449-2683
FAX: (573) 442-6213**

**Issued for Bid
October 27, 2023**

ARCHITECT:

I hereby certify these Drawings and/or Specifications have been prepared by me, or under my supervision. I further certify that to the best of my knowledge these Drawings and/or Specifications are as required by and in compliance with Building Codes of the University of Missouri.

The below listed Drawings and/or Specification sections have been prepared by me, or under my supervision. Any Specification sections within this document, not listed below, are not certified under this statement and are the responsibility of other parties



2023-10-27

Signature: _____

Eric S. Roselle – MO License No.: #A-2014036992

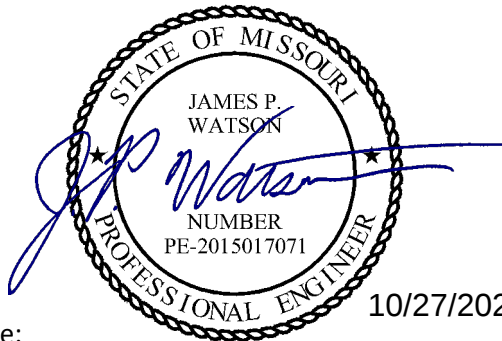
Certified Drawings:		Certified Specification Sections:	
G001	COVER SHEET	02 4100	Demolition
G002	LOCATION MAP, LIST OF DRAWINGS, LEGENDS, BUILDING CODE	04 0100	Maintenance of Masonry
		04 4313	Stone Masonry Veneer
G101	STAGING PLAN, TRAFFIC CONTROL PLAN	05 5000	Metal Fabrications
		05 7000	Decorative Metal
D101	DEMOLITION: GROUND FLOOR PLAN & DETAILS	06 1000	Rough Carpentry
		06 2000	Finish Carpentry
D102	DEMOLITION: FIRST FLOOR PLAN & ADDITION ROOF PLAN	07 1400	Fluid-Applied Waterproofing
		07 4112	Metal Soffit Panels
D103	DEMOLITION: SECOND & THIRD FLOOR PLANS	07 6200	Sheet Metal Flashing and Trim
		07 9200	Joint Sealants
D110	DEMOLITION: GROUND FLOOR REFLECTED CEILING PLAN	08 4313	Aluminum-Framed Entrances
		08 5113	Aluminum Windows
D111	DEMOLITION: FIRST FLOOR REFLECTED CEILING PLAN	08 7100	Door Hardware
		08 8000	Glazing
D112	DEMOLITION: SECOND & THIRD FLOOR REFLECTED CEILING PLANS	08 9100	Louvers
		09 2613	Gypsum Veneer Plastering
D201	DEMOLITION: BUILDING ELEVATIONS	09 5100	Suspended Acoustical Ceilings
D202	DEMOLITION: BUILDING ELEVATIONS	09 6500	Resilient Flooring

A101	GROUND FLOOR PLAN & DETAILS	09 9000	Painting and Coating
A102	FIRST FLOOR PLAN & ADDITION ROOF PLAN	12 2400	Window Shades
A103	SECOND & THIRD FLOOR PLANS		
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A302	WALL SECTIONS, DETAILS		
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A502	DETAILS		
A610	DOOR SCHEDULE, WINDOW SCHEDULE, ELEVATIONS, & DETAILS		
A611	DOOR, WINDOW, & LOUVER DETAILS		
A612	DOOR, WINDOW, & LOUVER DETAILS		
A613	DOOR, WINDOW, & LOUVER DETAILS		

ELECTRICAL ENGINEER:

I hereby certify these Drawings and/or Specifications have been prepared by me, or under my supervision. I further certify that to the best of my knowledge these Drawings and/or Specifications are as required by and in compliance with Building Codes of the University of Missouri.

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Signature: _____

James Watson, PE

Certified Drawings:

ED101 ELECTRICAL DEMOLITION PLAN
E101 NEW WORK PLAN
E501 ELECTRICAL DETAIL & SCHEDULES

Certified Specification Sections:

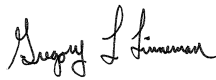
26 05 19	LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
26 05 26	GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
26 05 29	HANGERS & SUPPORTS FOR ELECTRICAL SYSTEMS
26 05 33.13	CONDUIT FOR ELECTRICAL SYSTEMS
26 05 33.16	BOXES FOR ELECTRICAL SYSTEMS
26 05 53	IDENTIFICATIONS FOR ELECTRICAL SYSTEMS
26 56 00	EXTERIOR LIGHTING

STRUCTURAL ENGINEER:

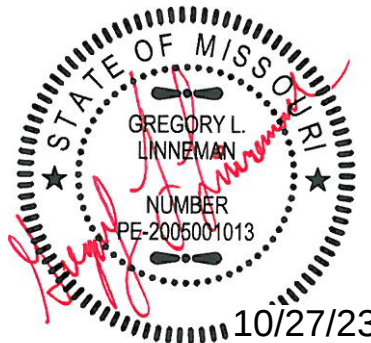
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Signature: _____



Greg Linneman, PE



GREGORY L. LINNEMAN - PE
MO LICENSE - 2005001013

Certified Drawings:

S100 STAIR PLAN & DETAILS

Certified Specification Sections:

32 1313 CONCRETE PAVING

SECTION 00 0110

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Building Envelope Repairs
Project CP220951
Columbia, Missouri

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PLANNING DESIGN & CONSTRUCTION

900 E. Stadium, Ste. 130
Columbia, Missouri 65211
Telephone: (573) 882-6800

ADVERTISEMENT FOR BIDS

Sealed bids for:

HILL HALL –
BUILDING ENVELOPE REPAIRS
UNIVERSITY OF MISSOURI
COLUMBIA, MISSOURI
PROJECT NUMBER: CP220951

CONSTRUCTION ESTIMATE: \$1,998,527 - \$2,220,585

will be received by the Curators of the University of Missouri, Owner, at Planning, Design & Construction, Room L100 (Front Reception Desk), General Services Building, University of Missouri, Columbia, Missouri 65211, until 1:30 p.m., C.T., November 21, 2023 and then immediately opened and publicly read aloud.

Drawings, specifications, and other related contract information may be obtained at <http://operations-webapps.missouri.edu/pdc/adsite/ad.html>. Electronic bid sets are available at no cost and may be printed as desired by the plan holders. No paper copies will be issued. If paper copies are desired, it is the responsibility of the user to print the files or have them printed.

Questions regarding the scope of work should be directed to Eric Roselle with PWArchitects at eroselle@pwarchitects.com or (573) 746-2574. Questions regarding commercial conditions should be directed to Heather Brown at (573) 884-6322 or brownheat@missouri.edu.

A prebid meeting will be held at 1:00 p.m., C.T., November 10, 2023 in the General Services Bldg., Room 194B, followed by a site walk-through.

A Diversity Participation goal of 10% MBE, 10% Combined WBE, DBE, Veteran Owned Business and 3% SDVE has been established for this contract.

The Owner reserves the right to waive informalities in bids and to reject any and all bids.

Individuals with special needs as addressed by the Americans with Disabilities Act may contact (573) 882-6800.

Advertisement Date: October 31, 2023

SECTION 1.A

BID FOR LUMP SUM CONTRACT

Date: _____

BID OF _____
(hereinafter called "Bidder") a corporation* organized and existing under laws of the State of _____

_____,
a partnership* consisting of _____,
an individual* trading as _____,
a joint venture* consisting of _____

*Insert Corporation(s), partnership or individual, as applicable.

TO: Curators of the University of Missouri
c/o Associate Vice Chancellor – Facilities
Room L100, General Services Building
University of Missouri – Columbia
Columbia, MO 65211

1. Bidder, in compliance with invitation for bids for construction work in accordance with Drawings and Specifications prepared by PWArchitects, Inc., entitled "Hill Hall – Building Envelope Repairs", project number CP220951, dated October 27, 2023, having examined Contract Documents and site of proposed work, and being familiar with all conditions pertaining to construction of proposed project, including availability of materials and labor, hereby proposes to furnish all labor, materials and supplies to construct project in accordance with Contract Documents, within time set forth herein at prices stated below. Prices shall cover all expenses, including taxes not covered by the University of Missouri's tax exemption status, incurred in performing work required under Contract documents, of which this Bid is a part.

Bidder acknowledges receipt of following addenda:

Addendum No. _____ Dated _____
Addendum No. _____ Dated _____
Addendum No. _____ Dated _____
Addendum No. _____ Dated _____

2. In following Bid(s), amount(s) shall be written in both words and figures. In case of discrepancy between words and figures, words shall govern.

3. **BID PRICING**

a. **Base Bid:**

The Bidder agrees to furnish all labor, materials, tools, and equipment required for masonry restoration and repair; all as indicated on the Drawings and described in these Specifications for sum of:

_____ DOLLARS (\$_____).

b. Unit Prices:

(1) For changing specified quantities of work from those indicated by Contract Drawings and Specifications, upon written instructions of Owner, the following Unit Prices shall prevail in accordance with General Conditions.

(2) The following Unit Prices include all labor, overhead and profit, materials, equipment, appliances, bailing, shoring, shoring removal, etc., to cover all work.

(3) The following Unit Prices are required where applicable to particular Base Bid and/or Alternate being submitted.

(4) Only a single Unit Price shall be given and it shall apply for either MORE or LESS work than that indicated on Drawings and called for in Specifications as indicated to be included in Base Bid and/or Alternates. In the event that more or less units than so indicated is actually furnished, Change Orders will be issued for increased or decreased amounts as approved by the Owner.

(5) Bidder understands that the Owner will not be liable for any Unit Price or any amount in excess of Base Bid and any Alternate(s) accepted at time of award of Contract, except as expressed in written Change Orders duly executed and delivered by Owner's Representative.

(6) Maintenance of Masonry Work, as defined in Section 04 0100, Maintenance of Masonry.

(a) Brick replacement for under 7 bricks grouped together; Scope-of-Work note A.

Base Bid quantity = 100 units \$ /unit

(b) Brick replacement for 7 and over bricks grouped together; Scope-of-Work note A.

Base Bid quantity = 110 sq.ft. \$ /sq.ft

(c) Replacement of existing stone w/ new limestone, matching the existing profile; Scope-of-Work note H.

Base Bid quantity = 20 cu.ft. \$ /cu.ft.

(d) Repointing of defective mortar joints in brick

Base Bid quantity = 4,420 sq. ft. \$ /sq.ft.

(e) Repointing of defective "rake and seal" (sealant over mortar) joints; Scope-of-Work notes B and D.

Base Bid quantity = 6,300 ln. ft. \$ /ln.ft.

(f) Repoint sealant at perimeter of all doors, windows, louvers, pipe and/or duct penetrations; Scope-of-Work note C.

Base Bid quantity = 400 ln. ft. \$ /ln.ft.

(g) Crack-Stitching; Scope-of-Work note E.

Base Bid quantity = 70 ln. ft. \$ /ln.ft.

(h) Patching of designated defective areas in stone with repair mortar; Scope-of-Work notes I and L.

Base Bid quantity = 5,000 cu. in. \$ _____/cu.in..

(i) Epoxy Injection; Scope-of-Work notes L and N.

Base Bid quantity = 44 ln. ft. \$ _____/ln. ft..

4. PROJECT COMPLETION

a. Contract Period - Contract period begins on the day the Contractor receives unsigned Contract, Performance Bond, Payment Bond, and "Instructions for Execution of Contract, Bonds, and Insurance Certificates." Bidder agrees to complete project within Two-Hundred Twenty-Nine (229) calendar days from receipt of aforementioned documents. Fifteen (15) calendar days have been allocated in construction schedule for receiving aforementioned documents from Bidder.

b. Commencement - Contractor agrees to commence work on this project after the "Notice to Proceed" is issued by the Owner. "Notice to Proceed" will be issued within seven (7) calendar days after Owner receives properly prepared and executed Contract documents listed in paragraph 4.a. above.

c. Special scheduling requirements:

May 15, 2024 On-site construction activities may begin

Aug 15, 2024 All work at Work Area 1, East elevation must be complete

All work at Work Area 2, North elevation must be complete

** See also sheet G101.*

5. SUBCONTRACTOR LIST:

Bidder hereby certifies that the following subcontractors will be used in performance of Work:

NOTE: Failure to list subcontractors for each category of work identified on this form or listing more than one subcontractor for any category of work without designating the portion of work performed by each shall be grounds for rejection of bid. List name, city, and state of designated subcontractor, for each category of work listed in Bid For Lump Sum Contract. If work within a category will be performed by more than one subcontractor, Bidder shall provide name, city, and state of each subcontractor and specify exact portion of work to be performed by each. If acceptance/non-acceptance of Alternates will affect designation of a subcontractor, Bidder shall provide information, for each affected category, with this bid form. If Bidder intends to perform any designated subcontract work by using Bidder's own employees, then Bidder shall list their own name, city, and state. The bidder may petition the Owner to change a listed subcontractor only within 48 hours of the bid opening. See Information For Bidders Section 16 List of Subcontractors for requirements.

Work to be performed

Subcontractor Name,

City, State

Masonry

Sealants

6. SUPPLIER DIVERSITY PARTICIPATION GOALS

a. The Contractor shall have as a combined goal subcontracting with Minority Business Enterprise (MBE), Women Business Enterprise (WBE), Disadvantage Business Enterprise (DBE), and/or Veteran Owned Business of TEN PERCENT (10%); and with Service Disabled Veteran Owned Business (SDVE) of THREE PERCENT (3%) of awarded contract price for work to be performed.

b. Requests for waiver of this goal shall be submitted on the attached Application For Waiver form. A determination by the Director of Facilities Planning & Development, UM, that a good faith effort has not been made by Contractor to achieve above stated goal may result in rejection of bid.

c. The Undersigned proposes to perform work with following Supplier Diversity participation level:

MBE, WBE, DBE, and/or VETERAN PERCENTAGE PARTICIPATION:

_____percent (____%)

SDVE PERCENTAGE PARTICIPATION:

_____percent (____%)

d. A Supplier Diversity Compliance Evaluation form shall be submitted with this bid for each diverse subcontractor to be used on this project.

7. BIDDER'S ACKNOWLEDGMENTS

a. Bidder declares that he has had an opportunity to examine the site of the work and he has examined Contract Documents; therefore, that he has carefully prepared his bid upon the basis thereof; that he has carefully examined and checked bid, materials, equipment and labor required thereunder, cost thereof, and his figures therefore. Bidder hereby states that amount, or amounts, set forth in bid is, or are, correct and that no mistake or error has occurred in bid or in Bidder's computations upon which this bid is based. Bidder agrees that he will make no claim for reformation, modifications, revisions or correction of bid after scheduled closing time for receipt of bids.

b. Bidder agrees that bid shall not be withdrawn for a period of Ninety (90) days after scheduled closing time for receipt of bids.

c. Bidder understands that Owner reserves right to reject any or all bids and to waive any informalities in bidding.

d. Accompanying the bid is a bid bond, or a certified check, or an irrevocable letter of credit, or a cashier's check payable without condition to "The Curators of the University of Missouri" which is an amount at least equal to five percent (5%) of amount of largest possible total bid herein submitted, including consideration of Alternates.

e. Accompanying the bid is a Bidder's Statement of Qualifications. Failure of Bidder to submit the Bidder's Statement of Qualifications with the bid may cause the bid to be rejected. Owner does not maintain Bidder's Statements of Qualifications on file.

f. It is understood and agreed that bid security of two (2) lowest and responsive Bidders will be retained until Contract has been executed and an acceptable Performance Bond and Payment Bond has been furnished. It is understood and agreed that if the bid is accepted and the undersigned fails to execute the Contract and furnish acceptable Performance/Payment Bond as required by Contract Documents, accompanying bid security will be realized upon or retained by Owner. Otherwise, the bid security will be returned to the undersigned.

8. BIDDER'S CERTIFICATE

Bidder hereby certifies:

a. His bid is genuine and is not made in interest of or on behalf of any undisclosed person, firm or corporation, and is not submitted in conformity with any agreement or rules of any group, association or corporation.

b. He has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid.

c. He has not solicited or induced any person, firm or corporation to refrain from bidding.

d. He has not sought by collusion or otherwise to obtain for himself any advantage over any other Bidder or over Owner.

e. He will not discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin in connection with performance of work.

f. By virtue of policy of the Board of Curators, and by virtue of statutory authority, a preference will be given to materials, products, supplies, provisions, and all other articles produced, manufactured, mined or grown within the State of Missouri. By virtue of policy of the Board of Curators, preference will also be given to all Missouri firms, corporations, or individuals, all as more fully set forth in "Information For Bidders."

9. BIDDER'S SIGNATURE

Note: All signatures shall be original; not copies, photocopies, stamped, etc.

Authorized Signature	Date
Printed Name	Title
Company Name	
Mailing Address	
City, State, Zip	
Phone No.	Federal Employer ID No.
Fax No.	E-Mail Address
Circle one: Individual Partnership Corporation Joint Venture	
If a corporation, incorporated under the laws of the State of _____	
Licensed to do business in the State of Missouri? ____yes ____no	

(Each Bidder shall complete bid form by manually signing on the proper signature line above and supplying required information called for in connection with the signature. Information is necessary for proper preparation of the Contract, Performance Bond and Payment Bond. Each Bidder shall supply information called for in accompanying "Bidder's Statement of Qualifications.")

END OF SECTION

**UNIVERSITY OF MISSOURI
BIDDER'S STATEMENT OF QUALIFICATIONS**

Submit with Bid for Lump Sum Contract in separate envelope appropriately labeled. Attach additional sheet if necessary.

1. Company Name _____
Phone# _____ Fax #: _____
Address _____
2. Number of years in business _____. If not under present firm name, list previous firm names and types of organization.

3. List contracts on hand (complete the following schedule, include telephone number).

Project & Address	Owner/Owner's Representative	Phone Number	Architect	Amount of your Contract	Percent Completed
4. General character of work performed by your company personnel.

5. List important projects completed in the last five (5) years on a type similar to the work now bid for, including approximate cost and telephone number.

Project & Address	Owner/Owner's Representative	Phone Number	Architect	Amount of your Contract	Percent Completed
6. Other experience qualifying you for the work now bid.

7. No default has been made in any contract complete or incomplete except as noted below:
(a) Number of contracts on which default was made _____
(b) Description of defaulted contracts and reason therefor _____

8. (a) Have you or your company participated in any contract subject to an equal opportunity clause similar to that described in the General Conditions?
Yes _____ No _____
(b) Have you filed all required compliance reports?
Yes _____ No _____

- (c) Is fifty percent or more of your company owned by a minority?
Yes _____ No _____
- (d) Is fifty percent or more of your company owned by a woman?
Yes _____ No _____
- (e) Is fifty percent or more of your company owned by a service disabled veteran?
Yes _____ No _____
- (f) Is fifty percent or more of your company owned by a veteran?
Yes _____ No _____
- (g) Is your company a Disadvantaged Business Enterprise?
Yes _____ No _____

9. Have you or your company been suspended or debarred from working at any University of Missouri campus?

Yes _____ No _____ (If the answer is "yes", give details.)

10. Have any administrative or legal proceedings been started against you or your company alleging violation of any wage and hour regulations or laws?

Yes _____ No _____ (If the answer is "yes", give details.)

11. Workers Compensation Experience Modification Rates (last 3 yrs): _____ / _____ / _____

Incidence Rates (last 3 years): _____ / _____ / _____

12. List banking references.

13. (a) Do you have a current confidential financial statement on file with Owner?
Yes _____ No _____ (If not, and if desired, Bidder may submit such statement with bid, in a separate sealed and labeled envelope.)

(b) If not, upon request will you file a detailed confidential financial statement within three (3) days?
Yes _____ No _____

Dated at _____ this _____ day of _____ 20____

Name of Organization

Signature

Printed Name

Title of Person Signing

END OF SECTION

UNIVERSITY OF MISSOURI
BIDDER'S STATEMENT OF QUALIFICATIONS FOR ASBESTOS ABATEMENT

Submit with Bid for Lump Sum Contract in separate envelope appropriately labeled. Attach additional sheet if necessary.

1. Company Name _____ Phone# _____

Address _____

2. State of Missouri Registration number _____

3. Number of years in business _____. If not under present firm name, list previous firm names and types of organization.

4. List contracts on hand (complete the following schedule, include telephone number).

Project & Address	Owner/Owner's Representative	Phone Number	Architect	Amount of your Contract	Percent Completed
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5. General character of work performed by your company personnel.

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Yes _____ No _____

(b) Have you filed all required compliance reports?

Yes _____ No _____

- (c) Is fifty percent or more of your company owned by a minority?
Yes _____ No _____
- (d) Is fifty percent or more of your company owned by a woman?
Yes _____ No _____
- (e) Is fifty percent or more of your company owned by a service disabled veteran?
Yes _____ No _____
- (f) Is fifty percent or more of your company owned by a veteran?
Yes _____ No _____
- (g) Is your company a Disadvantaged Business Enterprise?
Yes _____ No _____

10. Have you or your company been suspended or debarred from working at any University of Missouri campus?

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Yes _____ No _____ (If not, and if desired, Bidder may submit such statement with bid, in a separate sealed and labeled envelope.)

(b) If not, upon request will you file a detailed confidential financial statement within three (3) days?

Yes _____ No _____

Dated at _____ this _____ day of _____ 20____

Name of Organization

Signature

Printed Name

Title of Person Signing

END OF SECTION

SUPPLIER DIVERSITY COMPLIANCE EVALUATION FORM

This form shall be completed by Bidders and submitted with the Bidder's Statement of Qualifications form for each diverse firm who will function as a subcontractor on the contract.

The undersigned submits the following data with respect to this firm's assurance to meet the goal for Supplier Diversity participation.

- I. Project: _____
- II. Name of General Contractor: _____
- III. Name of Diverse Firm: _____
Address: _____
Phone No.: _____ Fax No.: _____
Status (check one) MBE _____ WBE _____ Veteran _____ Service Disabled Veteran _____ DBE _____
- IV. Describe the subcontract work to be performed. (List Base Bid work and any Alternate work separately):
Base Bid: _____

- V. Dollar amount of contract to be subcontracted to the Diverse firm:
Base Bid: _____
Alternate(s), (Identify separately): _____

- VI. Is the proposed subcontractor listed in the Directory of M/W/DBE Vendors, Directory of Served Disabled Veterans and/or the Directory of Veterans maintained by the State of Missouri?
Yes _____ No _____

Is the proposed subcontractor certified as a diverse supplier by any of the following: federal government agencies, state agencies, State of Missouri city or county government agencies, Minority and/or WBE certifying agencies?

Yes _____

No _____

If yes, please provide details and attach a copy of the certification.

Does the proposed subcontractor have a signed document from their attorney certifying the Supplier as a Diverse and meeting the 51% owned and committed requirement?

Yes _____

No _____

If yes, please attach letter.

Signature: _____

Name: _____

Title: _____

Date: _____

APPLICATION FOR WAIVER

This form shall be completed and submitted with the Bidder's Statement of Qualifications. Firms wishing to be considered for award are required to demonstrate that a good faith effort has been made to include diverse suppliers. This form will be used to evaluate the extent to which a good faith effort has been made. The undersigned submits the following data with respect to the firm's efforts to meet the goal for Supplier Diversity Participation.

1. List pre-bid conferences your firm attended where Supplier Diversity requirements were discussed.

2. Identify advertising efforts undertaken by your firm which were intended to recruit potential diverse subcontractors for various aspects of this project. Provide names of newspapers, dates of advertisements and copies of ads that were run.

3. Note specific efforts to contact in writing those diverse suppliers capable of and likely to participate as subcontractors for this project.

4. Describe steps taken by your firm to divide work into areas in which diverse suppliers/contractors would be capable of performing.

5. What efforts were taken to negotiate with prospective diverse suppliers/contractors for specific sub-bids? Include the names, addresses, and telephone numbers of diverse suppliers/contractors contacted, a description of the information given to diverse suppliers/contractors regarding plans and specifications for the assigned work, and a statement as to why additional agreements were not made with diverse suppliers/contractors.

6. List reasons for rejecting a diverse supplier/contractor which has been contacted.

8. Describe the follow-up contacts with diverse suppliers/contractors made by your firm after the initial solicitation.

9. Describe the efforts made by your firm to provide interested diverse suppliers/contractors with sufficiently detailed information about the plans, specifications and requirements of the contract.

10. Describe your firm's efforts to locate diverse suppliers/contractors.

Based on the above stated good faith efforts made to include supplier diversity, the bidder hereby requests that the original supplier diversity percentage goal be waived and that the percentage goal for this project be set at _____ percent.

The undersigned hereby certifies, having read the answers contained in the foregoing Application for Waiver, that they are true and correct to the best of his/her knowledge, information and belief.

Signature_____

Name_____

Title_____

Company_____

Date_____

AFFIDAVIT

"The undersigned swears that the foregoing statements are true and correct and include all material information necessary to identify and explain the operation of _____ (name of firm) as well as the ownership thereof. Further, the undersigned agrees to provide through the prime contractor or directly to the Contracting Officer current, complete and accurate information regarding actual work performed on the project, the payment therefore and any proposed changes, if any, of the project, the foregoing arrangements and to permit the audit and examination of books, records and files of the named firm. Any material misrepresentation will be grounds for terminating any contract which may be awarded and for initiating action under federal or state laws concerning false statements."

Note - If, after filing this information and before the work of this firm is completed on the contract covered by this regulation, there is any significant change in the information submitted, you must inform the Director of Facilities Planning and Development of the change either through the prime contractor or directly.

Signature _____

Name _____

Title _____

Date _____

Corporate Seal (where appropriate)

Date _____

State of _____

County of _____

On this _____ day of _____, 19_,
before me appeared (name) _____ to me personally known, who, being
duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by (name of firm)

_____ to execute the affidavit and did so as his or her own free act and deed.

(Seal)

Notary Public _____

Commission expires _____

AFFIDAVIT FOR AFFIRMATIVE ACTION

State of Missouri)
)
County of) ss.

_____ first being duly sworn on his/her oath
states: that he/she is the (sole proprietor, partner, or officer) of _____
_____ a (sole proprietorship, partnership, corporation), and as such (sole proprietor, partner, or officer) is
duly authorized to make this affidavit on behalf of said (sole proprietorship, partnership, corporation); that under the contract
known as " _____"
Project No. _____ less than 50 persons in the aggregate will be employed and therefore, the applicable Affirmative
Action requirements as set forth in the "Nondiscrimination in Employment Equal Opportunity," Supplemental Special
Conditions, and Article 13 in the General Conditions do not apply.

Subscribed and sworn before me this _____ day of _____, 19_____.

My commission expires _____, 19_____.

CERTIFYING SUPPLIER DIVERSITY AGENCIES

Diverse firms are defined in General Conditions Articles 1.1.7 and those businesses must be certified as disadvantaged by an approved agency. The Bidder is responsible for obtaining information regarding the certification status of a firm. A list of certified firms may be obtained by contacting the agencies listed below. Any firm listed as disadvantaged by any of the following agencies will be classified as a diverse firm by the Owner.

St. Louis Development Corporation
1520 Market St., Ste. 2000
St. Louis, MO 63103
P: 314.982.1400
W: www.stlouis-mo.gov/slhc/

Bi-State Development
211 N. Broadway, Ste. 700
St. Louis, MO 63102
P: 314.982.1400
W: www.metrostlouis.dbesystem.com

St. Louis Minority Business Council
211 N. Broadway, Ste. 1300
St. Louis, MO 63102
P: 314.231.5555
W: www.slmhc.org

U.S. Small Business Administration - St. Louis, MO
8(a) Contractors, Minority Small Business
1222 Spruce Street, Suite 10.103
St. Louis, MO 63101
P: 314.539.6600
W: www.sba.gov

Lambert St. Louis International Airport
Business Diversity Development Office
11495 Navaid
Bridgeton, MO 63044
P: 314-426-8111
W: www.flystl.com/business/business-diversity-development-1/directories

City of Kansas City, Missouri
Human Relations Department, MBE/WBE Division
4th Floor, City Hall
414 E. 12th Street
Kansas City, MO 64106
P: 816.513.1836
W: kcmohrd.mwdbe.com/?TN=kcmohrd

Mid-States Minority Supplier Development Council
505 N. 7th Street, Ste. 1820
St. Louis, MO 63101
P: 314.278.5616
W: midstatesdc.org

U.S. Small Business Administration - Kansas City, MO
8(a) Contractors, Minority Small Business
1000 Walnut, Suite 500
Kansas City, MO 64106
P: 816.426.4900
W: kcmohrd.mwdbe.com/?TN=kcmohrd

Missouri Department of Transportation
Division of Construction
1617 Missouri Blvd.
P.O. Box 270
Jefferson City, MO 65102
P: 573.526.2978
W: www.modot.org/mrcc-directory

Illinois Department of Transportation
MBE/WBE Certification Section
2300 Dirksen Parkway
Springfield, IL 62764
217/782-5490; 217/785-1524 (Fax)
W: webapps.dot.illinois.gov/UCP/ExternalSearch

State of Missouri OA
Office of Equal Opportunity
301 W. High St. HSC Rm 870-B
Jefferson City, MO 65101
P: 877.259.2963
W: oa.mo.gov/sites/default/files/sdvelisting.pdf
oeo.mo.gov/

Minority Newspapers

Dos Mundos Bilingual Newspaper
902A Southwest Blvd.
Kansas City, MO 64108
816-221-4747
www.dosmundos.com

Kansas City Hispanic News
2918 Southwest Blvd.
Kansas City, MO 64108
816/472-5246
www.kchispanicnews.com

The Kansas City Globe
615 E. 29th Street
Kansas City, MO 64109
816-531-5253
www.thekcglobe.com/about_us.php

St. Louis American
4144 Lindell
St. Louis, MO 63108
314-533-8000
www.stlamerican.com

St. Louis Chinese American News
1766 Burns Ave, Suite 201
St. Louis, MO 63132
314-432-3858
www.scanews.com

St. Louis Business Journal
815 Olive St., Suite 100
St. Louis, MO 63101
314-421-6200
www.bizjournal.com/stlouis

Kansas City Business Journal
1100 Main Street, Suite 210
Kansas City, MO 64105
816-421-5900
www.bizjournals.com/kansascity

AFFIDAVIT OF SUPPLIER DIVERSITY PARTICIPATION

The apparent low Bidder shall complete and submit this form within 48 hours of bid opening for each Diverse firm that will participate on the contract.

1. Diverse Firm: _____

Contact Name: _____

Address: _____

Phone No.: _____ E-Mail: _____

Status (check one) MBE ☐ WBE ☐ Veteran ☐ Service Disabled Veteran ☐ DBE ☐

If MBE, Certified as (circle one): 1) Black American 2) Hispanic American 3) Native American 4) Asian American

2. Is the proposed diverse firm certified by an approved agency [see IFB article 15]? Yes ☐ No ☐

Agency: _____ [attach copy of certification authorization from agency]

Certification Number: _____

3. Diverse firm scope work and bid/contract dollar amount of participation (List Base Bid and Alternate work separately). The final Dollar amount will be determined at substantial completion:

	Scope of Work	Bid/Contract Amount	Final Dollar Amount
Base Bid			
Alternate #1			
Alternate #2			
Alternate #3			
Alternate #4			
Alternate #5			
Alternate #6			

The undersigned certifies that the information contained herein (i.e. Scope of Work and Bid/Contract Amount) is true and correct to the best of their knowledge, information and belief.

General Contractor: _____

Diverse Firm: _____

Signature: _____

Signature: _____

Name: _____

Name: _____

Title: _____

Title: _____

Date: _____

Date: _____

The undersigned certifies that the information contained herein (i.e. Scope of Work and Final Dollar Amount) is true and correct to the best of their knowledge, information and belief. If the Final Dollar Amount is different than the Bid/Contract Amount, then attach justification for the difference.

Contractor: _____

Diverse Firm: _____

Signature: _____

Signature: _____

Name: _____

Name: _____

Title: _____

Title: _____

Date: _____

Date: _____

INFORMATION FOR BIDDERS

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1. Contract Documents

1.1 Drawings, specifications, and other contract documents, pursuant to work, which is to be done, may be obtained shown in the Advertisement for Bids and Special Conditions.

2. Bidder Obligations

2.1 Before submitting bids, each bidder shall carefully examine the drawings and specifications and related contract documents, visit site of work, and fully inform themselves as to all existing conditions, facilities, restrictions, and other matters which can affect the work or the cost thereof.

2.2 Each bidder shall include in their bid the cost of all work and materials required to complete the contract in a first-class manner as hereinafter specified.

2.3 Failure or omission of any bidder to receive or examine any form, instrument, addendum, or other document, or to visit the site and acquaint themselves with existing conditions, shall in no way relieve them from any obligation with respect to their bid or contract, and no extra compensation will be allowed by reason of anything or matter concerning which bidder should have fully informed themselves prior to bidding.

2.4 Submission of bids shall be deemed acceptance of the above obligations and each and every obligation required to be performed by all of the contract documents in the event the bid is accepted.

3. Interpretation of Documents

3.1 If any prospective bidder is in doubt as to the true meaning of any part of the drawings and specifications or contract documents, they shall submit a written request to the Architect for an interpretation.

3.2 Requests for such interpretations shall be delivered to the Architect at least one (1) week prior to time for receipt of bids.

3.3 Bids shall be based only on interpretations issued in the form of addenda mailed to each person who is on the

Architect's record as having received a set of the contract documents.

4. Bids

4.1 Bids shall be received separately or in combination as shown in and required by the Bid for Lump Sum contract. Bids will be completed so as to include insertion of amounts for alternate bids, unit prices and cost accounting data.

4.2 Bidders shall apportion each base bid between various phases of the work, as stipulated in the Bid for Lump Sum contract. All work shall be done as defined in the specifications and as indicated on the drawings.

4.3 Bids shall be presented in sealed envelopes which shall be plainly marked "Bids for (indicate name of project from cover sheet)" and mailed or delivered to the building and room number specified in the Advertisement for Bids. Bidders shall be responsible for actual delivery of bids during business hours, and it shall not be sufficient to show that a bid was mailed in time to be received before scheduled closing time for receipt of bids, nor shall it be sufficient to show that a bid was somewhere in a university facility.

4.4 The bidder's price shall include all federal sales, excise, and similar taxes, which may be lawfully assessed in connection with their performance of work and purchase of materials to be incorporated in the work. City & State taxes shall not be included as defined within Article 3.16 of the General Conditions for Construction Contract included in the contract documents.

4.5 Bids shall be submitted on a single bid form, furnished by the Owner or Architect. Do not remove the bid form from the specifications.

4.6 No bidder shall stipulate in their bid any conditions not contained in the bid form.

4.7 The Owner reserves the right to waive informalities in bids and to reject any or all bids.

5. Modification and Withdrawal of Bids

5.1 The bidder may withdraw their bid at any time before the scheduled closing time for receipt of bids, but no bidder may withdraw their bid after the scheduled closing time for receipt of bids.

5.2 Only telegrams, letters and other written requests for modifications or correction of previously submitted bids, contained in a sealed envelope which is plainly marked "Modification of Bid on (name of project on cover sheet)," which are addressed in the same manner as bids, and are received by Owner before the scheduled closing time for receipt of bids will be accepted and bids corrected in accordance with such written requests.

6. Signing of Bids

6.1 Bids which are signed for a partnership shall be **manually** signed in the firm name by at least one partner, or in the firm name by Attorney-in-Fact. If signed by Attorney-in-Fact there should be attached to the bid, a Power of Attorney evidencing authority to sign the bid dated the same date as the bid and executed by all partners of the firm.

6.2 Bids that are signed for a corporation shall have the correct corporate name thereon and the signature of an authorized officer of the corporation manually written below corporate name. Title of office held by the person signing for the corporation shall appear below the signature of the officer.

6.3 Bids that are signed by an individual doing business under a firm name, shall be manually signed in the name of the individual doing business under the proper firm name and style.

6.4 Bids that are signed under joint venture shall be manually signed by officers of the firms having authority to sign for their firm.

7. Bid Security

7.1 Each bid shall be accompanied by a bid bond, certified check, or cashier's check, acceptable to and payable without condition to The Curators of the University of Missouri, in an amount at least equal to five percent (5%) of bidder's bid including additive alternates.

7.2 Bid security is required as a guarantee that bidder will enter into a written contract and furnish a performance bond within the time and in form as specified in these specifications; and if successful bidder fails to do so, the bid security will be realized upon or retained by the Owner. The apparent low bidder shall notify the Owner in writing within 48 hours (2 workdays) of the bid opening of any circumstance that may affect the bid security including, but not limited to, a bidding error. This notification will not guarantee release of the bidder's security and/or the bidder from the Bidder's Obligations.

7.3 If a bid bond is given as a bid security, the amount of the bond may be stated as an amount equal to at least five percent (5%) of the bid, including additive alternates, described in the bid. The bid bond shall be executed by the bidder and a responsible surety licensed in the State of Missouri with a Best's rating of no less than A-/XI.

7.4 It is specifically understood that the bid security is a guarantee and shall not be considered as liquidated damages for failure of bidder to execute and deliver their contract and performance bond, nor limit or fix bidder's liability to Owner for any damages sustained because of failure to execute and deliver the required contract and performance bond.

7.5 Bid security of the two (2) lowest and responsive Bidders will be retained by the Owner until a contract has been executed and an acceptable bond has been furnished, as required hereby, when such bid security will be returned. Surety bid bonds of all other bidders will be destroyed and all other alternative forms of bid bonds will be returned to them within ten (10) days after Owner has determined the two (2) lowest and responsive bids.

8. Bidder's Statement of Qualifications

8.1 Each bidder submitting a bid shall present evidence of their experience, qualifications, financial responsibility and ability to carry out the terms of the contract by completing and submitting with their bid the schedule of information set forth in the form furnished in the bid form.

8.2 Such information, a single copy required in a separate sealed envelope, will be treated as confidential information by the Owner, within the meaning of Missouri Statue 610.010.

8.3 Bids not accompanied with current Bidder's Statement of Qualifications may be rejected.

9. Award of Contract

9.1 The Owner reserves the right to let other contracts in connection with the work, including, but not by way of limitation, contracts for furnishing and installation of furniture, equipment, machines, appliances, and other apparatus.

9.2 In awarding the contract, the Owner may take into consideration the bidder's, and their subcontractor's, ability to handle promptly the additional work, skill, facilities, capacity, experience, ability, responsibility, previous work, financial standing of bidder, and the bidder's ability to provide the required bonds and insurance; quality, efficiency and construction of equipment proposed to be furnished; period of time within which equipment is proposed to be furnished and delivered; success in achieving the specified Supplier Diversity goal, or demonstrating a good faith effort as described in Article 15; necessity of prompt and efficient completion of work herein described, and the bidder's status as suspended or debarred. Inability of any bidder to meet the requirements mentioned above may be cause for rejection of their bid.

10. Contract Execution

10.1 The Contractor shall submit within fifteen (15) days from receipt of notice, the documents required in Article 9 of the General Conditions for Construction Contract included in the contract documents.

10.2 No bids will be considered binding upon the Owner until the documents listed above have been furnished. Failure of Contractor to execute and submit these documents within the time period specified will be treated, at the option of the

Owner, as a breach of the bidder's bid security under Article 7 and the Owner shall be under no further obligation to Bidder.

11. Contract Security

11.1 When the Contract sum exceeds \$50,000, the Contractor shall procure and furnish a Performance bond and a Payment bond in the form prepared by Owner. Each bond shall be in the amount equal to one hundred percent (100%) of the contract sum, as well as adjustments to the Contract Sum. The Performance Bond shall secure and guarantee Contractor's faithful performance of this Contract, including but not limited to Contractor's obligation to correct defects after final payment has been made as required by the Contract Documents. The Payment Bond shall secure and guarantee payment of all persons performing labor on the Project under this Contract and furnishing materials in connection with this Contract. These Bonds shall be in effect through the duration of the Contract plus the Guaranty Period as required by the Contract Documents.

11.2 The bonds required hereunder shall be meet all requirements of Article 11 of the General Conditions for Construction Contract included in the contract documents.

11.3 If the surety of any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to conduct business in the State of Missouri is terminated, or it ceases to meet the requirements of this Article 11, Contractor shall within ten (10) days substitute another bond and surety, both of which must be acceptable to Owner. If Contractor fails to make such substitution, Owner may procure such required bonds on behalf of Contractor at Contractor's expense.

12. Time of Completion

12.1 Contractors shall agree to commence work within five (5) days of the date "Notice to Proceed" is received from the Owner, and the entire work shall be completed by the completion date specified or within the number of consecutive calendar days stated in the Special Conditions. The duration of the construction period, when specified in consecutive calendar days, shall begin when the contractor receives notice requesting the documents required in Article 9 of the General Conditions for Construction Contract included in the contract documents.

13. Number of Contract Documents

13.1 The Owner will furnish the Contractor a copy of the executed contract and performance bond.

13.2 The Owner will furnish the Contractor the number of copies of complete sets of drawings and specifications for the work, as well as clarification and change order drawings pertaining to change orders required during construction as set forth in the Special Conditions.

14. Missouri Products and Missouri Firms

14.1 The Curators of the University of Missouri have adopted a policy which is binding upon all employees and departments of the University of Missouri, and which by contract, shall be binding upon independent contractors and subcontractors with the University of Missouri whereby all other things being equal, and when the same can be secured without additional cost over foreign products, or products of other states, a preference shall be granted in all construction, repair and purchase contracts, to all products, commodities,

materials, supplies, and articles mined, grown, produced, and manufactured in marketable quantity and quality in the State of Missouri, and to all firms, corporations or individuals doing business as Missouri firms, corporations, or individuals. Each bidder submitting a bid agrees to comply with and be bound by the foregoing policy.

15. SUPPLIER DIVERSITY

15.1 Award of Contract

The Supplier Diversity participation goal for this project is stated on the Bid for Lump Sum Contract Form, and the Owner will take into consideration the bidder's success in achieving the Supplier Diversity participation goal in awarding the contract. Inability of any bidder to meet this requirement may be cause for rejection of their bid.

A 3-point Service-Disabled Veteran Enterprises (SDVE) bonus preference shall apply to this contract. The 3 bonus points can be obtained by a certified, Missouri based SDVE performing a commercially useful function, (as defined in Article 1 of the General Conditions of the Contract for Construction) either by submitting a bid directly to the Owner, or through the utilization of certified SDVE subcontractors and/or suppliers, whose participation provides at least 3% of the total bid amount. A firm does not perform a commercially useful function if its role is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of SDVE participation. In determining whether a firm is such an extra participant, the Owner will examine similar transactions, particularly those in which SDVEs do not participate. The 3-point bonus preference shall be calculated and applied by reducing the bid amount of the eligible bidder by three (3) percent of the apparent low responsive bidder's bid. Based on this calculation, if the eligible bidder's resulting total bid valuation is less than the apparent low responsive bidder's bid, the eligible bid becomes the apparent low responsive bid. This reduction is for evaluation purposes only and will have no impact on the actual amount(s) of the eligible bidder's bid or the amount(s) of any contract awarded. The submitted bid form must include a minimum of 3% SDVE participation to obtain the three (3) point bonus. For every SDVE firm utilized, a completed AFFIDAVIT OF SUPPLIER DIVERSITY PARTICIPATION form shall be submitted to the Owner within 24 hours of the receipt of bids. Failure to do so may be grounds for rejection of the SDVE bonus preference.

15.2 List of Supplier Diversity Firms

15.2.1 The bidder shall submit as part of their bid a list of diverse firms performing as contractor, subcontractors, and/or suppliers. The list shall specify the single designated diverse firm name and address. If acceptance or non-acceptance of alternates will affect the designation of a subcontractor, provide information for each affected category.

15.2.2 Failure to include a complete list of diverse firms may be grounds for rejection of the bid.

15.2.3 The list of diverse firms shall be submitted in addition to any other listing of subcontractors required in the Bid for Lump Sum Contract Form.

15.3 Supplier Diversity Percentage Goal

The bidder shall have a minimum goal of subcontracting with diverse contractors, subcontractors, and suppliers, the percent

of contract price stated in the Supplier Diversity goal paragraph of the Bid for Lump Sum Contract Form.

15.4 Supplier Diversity Percent Goal Computation

15.4.1 The total dollar value of the work granted to the diverse firms by the successful bidder is counted towards the applicable goal of the entire contract, unless otherwise noted below.

15.4.2 The bidder may count toward the Supplier Diversity goal only expenditures to diverse firms that perform a commercially useful function in the work of a contract. A diverse firm is considered to perform a commercially useful function when it is responsible for executing a distinct element of the work and carrying out its responsibilities by actually performing, managing and supervising the work involved. A bidder that is a certified diverse firm may count as 100% of the contract towards the Supplier Diversity goal. For projects with separate MBE, SDVE, and WBE/Veteran/DBE goals, a MBE firm bidding as the prime bidder is expected to obtain the required SDVE, and WBE/Veteran/ DBE participation; a WBE or Veteran or DBE firm bidding as the prime bidder is expected to obtain the required MBE and SDVE participation and a SDVE firm bidding as the prime bidder is expected to obtain the required MBE, and WBE/Veteran/ DBE participation.

15.4.3 When a MBE, WBE, Veteran Business Enterprise, DBE, or SDVE performs work as a participant in a joint venture, only the portion of the total dollar value of the contract equal to the distinct, clearly defined portion of the work of the contract that the MBE, WBE, Veteran Business Enterprise, DBE, or SDVE performs with its own forces shall count toward the MBE, WBE, Veteran Business Enterprise, DBE, or SDVE individual contract percentages.

15.4.4 The bidder may count toward its Supplier Diversity goal expenditures for materials and supplies obtained from diverse suppliers and manufacturers, provided the diverse firm assumes the actual and contractual responsibility for the provision of the materials and supplies.

15.4.4.1 The bidder may count its entire expenditure to a diverse manufacturer. A manufacturer shall be defined as an individual or firm that produces goods from raw materials or substantially alters them before resale.

15.4.4.2 The bidder may count its entire expenditure to diverse suppliers that are not manufacturers provided the diverse supplier performs a commercially useful function as defined above in the supply process.

15.4.4.3 The bidder may count 25% of its entire expenditures to diverse firms that do not meet the definition of a subcontractor, a manufacturer, nor a supplier. Such diverse firms may arrange for, expedite, or procure portions of the work but are not actively engaged in the business of performing, manufacturing, or supplying that work.

15.4.5 The bidder may count toward the Supplier Diversity goal that portion of the total dollar value of the work awarded to a certified joint venture equal to the percentage of the ownership and control of the diverse partner in the joint venture.

15.5 Certification by Bidder of Diverse Firms

15.5.1. The bidder shall submit with its bid the information requested in the "Supplier Diversity Compliance Evaluation Form" for every diverse firm the bidder intends to award work to on the contract.

15.5.2. Diverse firms are defined in Article 1 – (Supplier Diversity Definitions) of the General Conditions of the Contract for Construction included in the contract documents, and as those businesses certified as disadvantaged by an approved agency. The bidder is responsible for obtaining information regarding the certification status of a firm. A list of certified firms may be obtained by contacting the agencies listed in the proposal form document "Supplier Diversity Certifying Agencies." Any firm listed as disadvantaged by any of the identified agencies will be classified as a diverse firm by the Owner.

15.5.3. Bidders are urged to encourage their prospective diverse contractors, subcontractors, joint venture participants, team partners, and suppliers who are not currently certified to obtain certification from one of the approved agencies.

15.6 Supplier Diversity Participation Waiver

15.6.1 The bidder is required to make a good faith effort to locate and contract with diverse firms. If a bidder has made a good faith effort to secure the required diverse firms and has failed, the bidder shall submit with the bid, the information requested in "Application for Supplier Diversity Participation Waiver." The Contracting Officer will review the bidder's actions as set forth in the bidder's "Application for Waiver" and any other factors deemed relevant by the Contracting Officer to determine if a good faith effort has been made to meet the applicable percentage goal. If the bidder is judged not to have made a good faith effort, the bid may be rejected. Bidders who demonstrate that they have made a good faith effort to include Supplier Diversity participation may be awarded the contract regardless of the percent of Supplier Diversity participation, provided the bid is otherwise acceptable and is determined to be the best bid.

15.6.2 To determine good faith effort of the bidder, the Contracting Officer may evaluate factors including, but not limited to, the following:

15.6.2.1 The bidder's attendance at pre-proposal meetings scheduled to inform bidders and diverse firms of contracting and subcontracting opportunities and responsibilities associated with Supplier Diversity participation.

15.6.2.2 The bidder's advertisements in general circulation trade association, and diverse (minority) focused media concerning subcontracting opportunities.

15.6.2.3 The bidder's written notice to specific diverse firms that their services were being solicited in sufficient time to allow for their effective participation.

15.6.2.4 The bidder's follow-up attempts to the initial solicitation(s) to determine with certainty whether diverse firms were interested.

15.6.2.5 The bidder's efforts to divide the work into packages suitable for subcontracting to diverse firms.

15.6.2.6 The bidder's efforts to provide interested diverse firms with sufficiently detailed information about the drawings, specific actions and requirements of the contract, and clear scopes of work for the firms to bid on.

15.6.2.7 The bidder's efforts to solicit for specific sub-bids from diverse firms in good faith. Documentation should include names, addresses, and telephone numbers of firms contacted a description of all information provided the diverse firms, and an explanation as to why agreements were not reached.

15.6.2.8 The bidder's efforts to locate diverse firms not on the directory list and assist diverse firms in becoming certified as such.

15.6.2.9 The bidder's initiatives to encourage and develop participation by diverse firms.

15.6.2.10 The bidder's efforts to help diverse firms overcome legal or other barriers impeding the participation of diverse firms in the construction contract.

15.6.2.11 The availability of diverse firms and the adequacy of the bidder's efforts to increase the participation of such business provided by the persons and organizations consulted by the bidder.

15.7 Submittal of Forms

15.7.1 The bidder will include the Supplier Diversity Compliance Evaluation Form(s), or the Application for Waiver and other form(s) as required above in the envelope containing the "Bidder's Statement of Qualifications", see Article 8.

15.8 Additional Bid/Proposer Information

15.8.1 The Contracting Officer reserves the right to request additional information regarding Supplier Diversity participation and supporting documentation from the apparent low bidder. The bidder shall respond in writing to the Contracting Officer within 24 hours (1 workday) of a request.

15.8.2 The Contracting Officer reserves the right to request additional information after the bidder has responded to prior 24-hour requests. This information may include follow up and/or clarification of the information previously submitted.

15.8.3 The Owner reserves the right to consider additional diverse subcontractor and supplier participation submitted by the bidder after bids are opened under the provisions within these contract documents that describe the Owner's right to accept or reject subcontractors including, but not limited to, Article 16 below. The Owner may elect to waive the good faith effort requirement if such additional participation achieves the Supplier Diversity goal.

15.8.4 The Bidder shall provide the Owner information related to the Supplier Diversity participation included in the bidder's proposal, including, but is not limited to, the complete Application for Waiver, evidence of diverse certification of participating firms, dollar amount of participation of diverse firms, information supporting a good faith effort as described in Article 15.6 above, and a list of all diverse firms that submitted bids to the Bidder with the diverse firm's price and the name and the price of the firm awarded the scope of work bid by the diverse firm.

16. List of Subcontractors

16.1 If a list of subcontractors is required on the Bid for Lump Sum Contract Form, the bidders shall list the name, city and state of the firm(s) which will accomplish that portion of the contract requested in the space provided. This list is separate from both the list of diverse firms required in Article 15.2, and the complete list of subcontractors required in Article 10.1 of this document. Should the bidder choose to perform any of the listed portions of the work with its own forces, the bidder shall enter its own name, city and state in the space provided. If acceptance or non-acceptance of alternates will affect the designation of a subcontractor, the bidder shall provide that information on the bid form.

16.2 Failure of the bidder to supply the list of subcontractors required or the listing of more than one subcontractor for any category without designating the portion of the work to be performed by each, shall be grounds for the rejection of the bid. The bidder can petition the Owner to change a listed subcontractor within 48 hours of the bid opening. The Owner reserves the right to make the final determination on a petition to change a subcontractor. The Owner will consider factors such as clerical and mathematical bidding errors, listed subcontractor's inability to perform the work for the bid used, etc. Any request to change a listed subcontractor shall include at a minimum, contractor's bid sheet showing tabulation of the bid; all subcontractor bids with documentation of the time they were received by the contractor; and a letter from the listed subcontractor on their letterhead stating why they cannot perform the work if applicable. The Owner reserves the right to ask for additional information.

16.3 Upon award of the contract, the requirements of Article 10 of this document and Article 5 of the General Conditions of the Contract for Construction included in the contract documents will apply.

University of Missouri

General Conditions

of the

Contract

for

Construction

December 2021 Edition

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ARTICLE 1 GENERAL PROVISIONS

1.1 Basic Definitions

As used in the Contract Documents, the following terms shall have the meanings and refer to the parties designated in these definitions.

1.1.1 Owner

The Curators of the University of Missouri. The Owner may act through its Board of Curators or any duly authorized committee or representative thereof.

1.1.2 Contracting Officer

The Contracting Officer is the duly authorized representative of the Owner with the authority to execute contracts. Communications to the Contracting Officer shall be forwarded via the Owner's Representative.

1.1.3 Owner's Representative

The Owner's Representative is authorized by the Owner as the administrator of the Contract and will represent the Owner during the progress of the Work. Communications from the Architect to the Contractor and from the Contractor to the Architect shall be through the Owner's Representative, unless otherwise indicated in the Contract Documents.

1.1.4 Architect

When the term "Architect" is used herein, it shall refer to the Architect or the Engineer specified and defined in the Contract for Construction or its duly authorized representative. Communications to the Architect shall be forwarded to the address shown in the Contract for Construction.

1.1.5 Owner's Authorized Agent

When the term "Owner's Authorized Agent" is used herein, it shall refer to an employee or agency acting on the behalf of the Owner's Representative to perform duties related to code inspections, testing, operational systems check, certification or accreditation inspections, or other specialized work.

1.1.6 Contractor

The Contractor is the person or entity with whom the Owner has entered into the Contract for Construction. The term "Contractor" means the Contractor or the Contractor's authorized representative.

1.1.7 Subcontractor and Lower-tier Subcontractor

A Subcontractor is a person or organization who has a contract with the Contractor to perform any of the Work. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or its authorized representative. The term "Subcontractor" also is applicable to those furnishing materials to be incorporated in the Work whether work performed is at the Owner's site or off site, or both. A lower-tier Subcontractor is a person or organization who has a contract with a Subcontractor or another lower-tier

Subcontractor to perform any of the Work at the site. Nothing contained in the Contract Documents shall create contractual relationships between the Owner or the Architect and any Subcontractor or lower-tier Subcontractor of any tier.

1.1.8 Supplier Diversity Definitions

Businesses that fall into the Supplier Diversity classification shall mean an approved certified business concern which is at least fifty-one percent (51%) owned and controlled by one (1) or more diverse suppliers as described below.

.1 Minority Business Enterprises (MBE)

Minority Business Enterprise [MBE] shall mean an approved certified business concern which is at least fifty-one percent (51%) owned and controlled by one (1) or more minorities as defined below or, in the case of any publicly-owned business, in which at least fifty-one percent (51%) of the stock of which is owned by one (1) or more minorities as defined below, and whose management and daily business operations are controlled by one (1) or more minorities as defined herein.

.1.1 "African Americans", which includes persons having origins in any of the black racial groups of Africa.

.1.2 "Hispanic Americans", which includes persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.

.1.3 "Native Americans", which includes persons of American Indian, Eskimo, Aleut, or Native Hawaiian origin.

.1.4 "Asian-Pacific Americans", which includes persons whose origins are from Japan, China, Taiwan, Korea, Vietnam, Laos, Cambodia, the Philippines, Samoa, Guam, the U.S. Trust Territories of the Pacific, or the Northern Marianas.

.1.5 "Asian-Indian Americans", which includes persons whose origins are from India, Pakistan, or Bangladesh.

.2 Women Business Enterprise (WBE)

Women Business Enterprise [WBE] shall mean an approved certified business concern which is at least fifty-one percent (51%) owned and controlled by one (1) or more women or, in the case of any publicly owned business, in which at least fifty-one percent (51%) of the stock of which is owned by one (1) or more women, and whose management and daily business operations are controlled by one (1) or more women.

.3 Veteran Owned Business

Veteran Owned Business shall mean an approved certified business concern which is at least fifty-one percent (51%) owned and controlled by one (1) or more Veterans or, in the case of any publicly owned business, in which at least fifty-one percent (51%) of the stock of which is owned by one (1) or more Veterans, and whose management and daily business operations are controlled by one (1) or more Veterans. Veterans must be certified by the appropriate federal agency responsible for veterans' affairs.

.4 Service-Disabled Veteran Enterprise (SDVE)
Service-Disabled Veteran Enterprise (SDVE) shall mean a business certified by the State of Missouri Office of Administration as a Service-Disabled Veteran Enterprise, which is at least fifty-one percent (51%) owned and controlled by one (1) or more Served-Disabled Veterans or, in the case of any publicly-owned business, in which at least fifty-one percent (51%) of the stock of which is owned by one (1) or more Service-Disabled Veterans, and whose management and daily business operations are controlled by one (1) or more Served-Disabled Veterans.

.5 Disadvantaged Business Enterprise (DBE)
A Disadvantaged Business Enterprise (DBE) is a for-profit small business concern where a socially and economically disadvantaged individual owns at least 51% interest and also controls management and daily business operations. These firms can and also be referred to as Small Disadvantaged Businesses (SDB). Eligibility requirements for certification are stated in 49 CFR (Code of Federal Regulations), part 26, Subpart D.

U.S. citizens that are African Americans, Hispanics, Native Americans, Asian-Pacific and Subcontinent Asian Americans, and women are presumed to be socially and economically disadvantaged. Also recognized as DBE's are Historically Black Colleges and Universities (HBCU) and small businesses located in Federal HUB Zones.

To be regarded as economically disadvantaged, an individual must have a personal net worth that does not exceed \$1.32 million. To be seen as a small business, a firm must meet Small Business Administration (SBA) size criteria (500 employees or less) and have average annual gross receipts not to exceed \$22.41 million. To be considered a DBE/SDB, a small business owned and controlled by socially and/or economically disadvantaged individuals must receive DBE certification from one of the recognized Missouri state agencies to be recognized in this classification.

1.1.9 Work

Work shall mean supervision, labor, equipment, tools, material, supplies, incidentals operations and activities required by the Contract Documents or reasonably inferable by Contractor therefrom as necessary to produce the results intended by the Contract Documents in a safe, expeditious, orderly, and workmanlike manner, and in the best manner known to each respective trade.

1.1.10 Approved

The terms "approved", "equal to", "directed", "required", "ordered", "designated", "acceptable", "compliant", "satisfactory", and similar words or phrases will be understood to have reference to action on the part of the Architect and/or the Owner's Representative.

1.1.11 Contract Documents

The Contract Documents consist of (1) the executed Contract for Construction, (2) these General Conditions of

the Contract for Construction, (3) any Supplemental Conditions or Special Conditions identified in the Contract for Construction, (4) the Specifications identified in the Contract for Construction, (5) the Drawings identified in the Contract for Construction, (6) Addenda issued prior to the receipt of bids, (7) Contractor's bid addressed to Owner, including Contractor's completed Qualification Statement, (8) Contractor's Performance Bond and Contractor's Payment Bond, (9) Notice to Proceed, (10) and any other exhibits and/or post bid adjustments identified in the Contract for Construction, (11) Advertisement for Bid, (12) Information for Bidders, and (13) Change Orders issued after execution of the Contract. All other documents and technical reports and information are not Contract Documents, including without limitation, Shop Drawings, and Submittals.

1.1.12 Contract

The Contract Documents form the Contract and are the exclusive statement of agreement between the parties. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior representations or agreements, either written or oral. The Contract Documents shall not be construed to create a contractual relationship of any kind between the Owner and a Subcontractor or any lower-tier Subcontractor.

1.1.13 Change Order

The Contract may be amended or modified without invalidating the Contract, only by a Change Order, subject to the limitations in Article 7 and elsewhere in the Contract Documents. A Change Order is a written instrument signed by the Owner and the Contractor stating their agreement to a change in the Work, the amount of the adjustment to the Contract Sum, if any, and the extent of the adjustment to the Contract Time, if any. Agreement to any Change Order shall constitute a final settlement of all matters relating to the change in the work which is the subject of the Change Order, including, but not limited to, all direct and indirect costs associated with such change and any and all adjustments of the Contract sum, time and schedule.

1.1.14 Substantial Completion

The terms "Substantial Completion" or "substantially complete" as used herein shall be construed to mean the completion of the entire Work, including all submittals required under the Contract Documents, except minor items which in the opinion of the Architect, and/or the Owner's Representative will not interfere with the complete and satisfactory use of the facilities for the purposes intended.

1.1.15 Final Completion

The date when all punch list items are completed, including all closeout submittals and approval by the Architect is given to the Owner in writing.

1.1.16 Supplemental and Special Conditions

The terms "Supplemental Conditions" or "Special Conditions" shall mean the part of the Contract Documents

which amend, supplement, delete from, or add to these General Conditions.

1.1.17 Day

The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

1.1.18 Knowledge.

The terms "knowledge," "recognize" and "discover" their respective derivatives and similar terms in the Contract Documents, as used in reference to the Contractor, shall be interpreted to mean that which the Contractor knows or should know, recognizes, or should recognize and discovers or should discover in exercising the care, skill, and diligence of a diligent and prudent contractor familiar with the work. Analogously, the expression "reasonably inferable" and similar terms in the Contract Documents shall be interpreted to mean reasonably inferable by a diligent and prudent contractor familiar with the work.

1.1.19 Punch List

"Punch List" means the list of items, prepared in connection with the inspection(s) of the Project by the Owner's Representative or Architect in connection with Substantial Completion of the Work or a portion of the Work, which the Owner's Representative or Architect has designated as remaining to be performed, completed, or corrected before the Work will be accepted by the Owner.

1.1.20 Public Works Contracting Minimum Wage

The public works contracting minimum wage shall be equal to one hundred twenty percent of the average hourly wage in a particular locality, as determined by the Missouri economic research and information center within the department of economic development, or any successor agency.

1.1.21 Force Majeure

An event or circumstance that could not have been reasonably anticipated and is out of the control of both the Owner and the Contractor.

1.2 Specifications and Drawings

1.2.1 The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction system, standards and workmanship and performance of related services for the Work identified in the Contract for Construction. Specifications are separated into titled divisions for convenience of reference only. Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade. Such separation will not operate to make the Owner or the Architect an arbiter of labor disputes or work agreements.

1.2.2 The drawings herein referred to, consist of drawings prepared by the Architect and are enumerated in the Contract Documents.

1.2.3 Drawings are intended to show general arrangements, design, and dimensions of work and are partly diagrammatic. Dimensions shall not be determined by scale or rule. If figured dimensions are lacking, they shall be supplied by the Architect on the Contractor's written request to the Owner's Representative.

1.2.4 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complimentary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the intended results.

1.2.5 In the event of inconsistencies within or between parts of the Contract Documents, or between the Contract Documents and applicable standards, codes and ordinances, 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 Owner's Representative's interpretation. On the Drawings, given dimensions shall take precedence over scaled measurements and large-scale drawings over small scale drawings. Before ordering any materials or doing any Work, the Contractor and each Subcontractor shall verify measurements at the Work site and shall be responsible for the correctness of such measurements. Any difference which may be found shall be submitted to the Owner's Representative and Architect for resolution before proceeding with the Work. If a minor change in the Work is found necessary due to actual field conditions, the Contractor shall submit detailed drawings of such departure for the approval by the Owner's Representative and Architect before making the change.

1.2.6 Data in the Contract Documents concerning lot size, ground elevations, present obstructions on or near the site, locations and depths of sewers, conduits, pipes, wires, etc., position of sidewalks, curbs, pavements, etc., and nature of ground and subsurface conditions have been obtained from sources the Architect believes reliable, but the Architect and Owner do not represent or warrant that this information is accurate or complete. The Contractor shall verify such data to the extent possible through normal construction procedures, including but not limited to contacting utility owners and by prospecting.

1.2.7 Only work included in the Contract Documents is authorized, and the Contractor shall do no work other than that described therein.

1.2.8 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become familiar with local conditions under which the Work is to be

performed and correlated personal observations with requirements of the Contract Documents. Contractor represents that it has performed its own investigation and examination of the Work site and its surroundings and satisfied itself before entering into this Contract as to:

- .1 conditions bearing upon transportation, disposal, handling, and storage of materials;
- .2 the availability of labor, materials, equipment, water, electrical power, utilities and roads;
- .3 uncertainties of weather, river stages, flooding and similar characteristics of the site;
- .4 conditions bearing upon security and protection of material, equipment, and Work in progress;
- .5 the form and nature of the Work site, including the surface and sub-surface conditions;
- .6 the extent and nature of Work and materials necessary for the execution of the Work and the remedying of any defects therein; and
- .7 the means of access to the site and the accommodations it may require and, in general, shall be deemed to have obtained all information as to risks, contingencies and other circumstances.
- .8 the ability to complete work without disruption to normal campus activities, except as specifically allowed in the contract documents.

The Owner assumes no responsibility or liability for the physical condition or safety of the Work site or any improvements located on the Work site. The Contractor shall be solely responsible for providing a safe place for the performance of the Work. The Owner shall not be required to make any adjustment in either the Contract Sum or Contract Time concerning any failure by the Contractor or any Subcontractor to comply with the requirements of this Paragraph.

1.2.9 Drawings, specifications, and copies thereof furnished by the Owner are and shall remain the Owner's property. They are not to be used on another project and, with the exception of one contract set for each party to the Contract, shall be returned to the Owner's Representative on request, at the completion of the Work.

1.3 Required Provisions Deemed Inserted

Each and every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein, and the Contract shall be read and enforced as though it were included herein; and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the written application of either party the Contract shall forthwith be physically amended to make such insertion or correction.

ARTICLE 2 OWNER

2.1 Information and Services Required of Owner

2.1.1 Permits and fees are the responsibility of the Contractor under the Contract Documents, unless specifically stated in the contract documents that the Owner will secure and pay for specific necessary approvals, easements, assessments, and charges required for construction, use or occupancy of permanent structures, or for permanent changes in existing facilities.

2.1.2 When requested in writing by the Contractor, information or services under the Owner's control, which are reasonably necessary to perform the Work, will be furnished by the Owner with reasonable promptness to avoid delay in the orderly progress of the Work.

2.2 Owner's Right to Stop the Work

2.2.1 If the Contractor fails to correct Work which is not in strict accordance with the requirements of the Contract Documents or fails to carry out Work in strict accordance with the Contract Documents, the Owner's Representative may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work will not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity. Owner's lifting of Stop Work Order shall not prejudice Owner's right to enforce any provision of this Contract.

2.3 Owner's Right to Carry Out the Work

2.3.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven (7) day period after receipt of a written notice from the Owner to correct such default or neglect, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. In such case, an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the cost of correcting such deficiencies, including compensation for the Architect's additional services and expenses made necessary by such default or neglect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to Owner. However, such notice shall be waived in the event of an emergency with the potential for property damage or the endangerment of students, faculty, staff, the public or construction personnel, at the sole discretion of the Owner.

2.3.2 In the event the Contractor has not satisfactorily completed all items on the Punch List within thirty (30) days of its receipt, the Owner reserves the right to complete the Punch List without further notice to the Contractor or its surety. In such case, Owner shall be entitled to deduct from payments then or thereafter due the Contractor the cost of completing the Punch List items, including compensation for the Architect's additional services. If payments then or

thereafter due Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to Owner.

2.4 Extent of Owner Rights

2.4.1 The rights stated in this Article 2 and elsewhere in the Contract Documents are cumulative and not in limitation of any rights of the Owner (1) granted in the Contract Documents, (2) at law or (3) in equity.

2.4.2 In no event shall the Owner have control over, charge of, or any responsibility for construction means, methods, techniques, sequences or procedures or for safety precautions and programs in connection with the Work, notwithstanding any of the rights and authority granted the Owner in the Contract Documents.

ARTICLE 3 CONTRACTOR

3.1 Contractor's Warranty

3.1.1 The Contractor warrants all equipment and materials furnished, and work performed, under this Contract, against defective materials and workmanship for a period of twelve months after acceptance as provided in this Contract, unless a longer period is specified, regardless of whether the same were furnished or performed by the Contractor or any Subcontractors of any tier. Upon written notice from the Owner of any breach of warranty during the applicable warranty period due to defective material or workmanship, the affected part or parts thereof shall be repaired or replaced by the Contractor at no cost to the Owner. Should the Contractor fail or refuse to make the necessary repairs, replacements, and tests when requested by the Owner, the Owner may perform, or cause the necessary work and tests to be performed, at the Contractor's expense, or exercise the Owner's rights under Article 14.

3.1.2 Should one or more defects mentioned above appear within the specified period, the Owner shall have the right to continue to use or operate the defective part or apparatus until the Contractor makes repairs or replacements or until such time as it can be taken out of service without loss or inconvenience to the Owner.

3.1.3 The above warranties are not intended as a limitation but are in addition to all other express warranties set forth in this Contract and such other warranties as are implied by law, custom, and usage of trade. The Contractor, and its surety or sureties, if any, shall be liable for the satisfaction and full performance of the warranties set forth herein.

3.1.4 Neither the final payment nor any provision in the Contract Documents nor partial or entire occupancy of the premises by the Owner, nor expiration of warranty stated herein, will constitute an acceptance of Work not

done in accordance with the Contract Documents or relieve the Contractor of liability in respect to any responsibility for non-conforming work. The Contractor shall immediately remedy any defects in the Work and pay for any damage to other Work resulting therefrom upon written notice from the Owner. Should the Contractor fail or refuse to remedy the non-conforming work, the Owner may perform, or cause to be performed the work necessary to bring the work into conformance with the Contract Documents at the Contractor's expense.

3.1.5 The Contractor agrees to defend, indemnify, and save harmless The Curators of the University of Missouri, their Officers, Agents, Employees and Volunteers, from and against all loss or expense from any injury or damages to property of others suffered or incurred on account of any breach of the aforesaid obligations and covenants. The Contractor agrees to investigate, handle, respond to and provide defense for and defend against any such liability, claims, and demands at the sole expense of the Contractor, or at the option of the University, agrees to pay to or reimburse the University for the defense costs incurred by the University in connection with any such liability claims, or demands. The parties hereto understand and agree that the University is relying on and does not waive or intend to waive by any provision of this Contract, any monetary limitations or any other rights, immunities, and protections provided by the State of Missouri, as from time to time amended, or otherwise available to the University, or its officers, employees, agents or volunteers.

3.2 Compliance with Laws, Regulations, Permits, Codes, and Inspections

3.2.1 The Contractor shall, without additional expense to the Owner, comply with all applicable laws, ordinances, rules, permit requirements, codes, statutes, and regulations (collectively referred to as "Laws").

3.2.2 Since the Owner is an instrumentality of the State of Missouri, municipal, or political subdivision, ordinances, zoning ordinances, and other like ordinances are not applicable to construction on the Owner's property, and the Contractor will not be required to submit plans and specifications to any municipal or political subdivision authority to obtain construction permits or any other licenses or permits from or submit to, inspection by any municipality or political subdivision relating to the construction on the Owner's property, unless required by the Owner in these Contract Documents or otherwise in writing.

3.2.3 All fees, permits, inspections, or licenses required by municipality or political subdivision for operation on property not belonging to the Owner, shall be obtained by and paid for by the Contractor. The Contractor, of its own expense, is responsible to ensure that all inspections required by said permits or licenses on property, easements, or utilities not belonging to the Owner are conducted as required therein. All connection charges, assessments or transportation fees as may be imposed by any utility company or others are

included in the Contract Sum and shall be the Contractor's responsibility, as stated in 2.1.1 above.

3.2.4 If the Contractor has knowledge that any Contract Documents are at variance with any Laws, including Americans with Disabilities Act – Standards for Accessible Design, ordinances, rules, regulations, or codes applying to the Work, Contractor shall promptly notify the Architect and the Owner's Representative, in writing, and any necessary changes will be adjusted as provided in the Contract Documents. However, it is not the Contractor's primary responsibility to ascertain that the Contract Documents are in accordance with applicable Laws, unless such Laws bear upon performance of the Work.

3.3 Anti-Kickback

3.3.1 No member or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this Contract or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this Contract if made with a corporation for its general benefit.

3.3.2 No official of the Owner who is authorized in such capacity and on behalf of the Owner to negotiate, make, accept or approve, or to take part in negotiating, making, accepting, or approving any architectural, engineering, inspection, construction, or material supply contract or any Subcontract of any tier in connection with the construction of the Work shall have a financial interest in this Contract or in any part thereof, any material supply contract, Subcontract of any tier, insurance contract, or any other contract pertaining to the Work.

3.4 Supervision and Construction Procedures

3.4.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the Work under the Contract. The Contractor shall supply sufficient and competent supervision and personnel, and sufficient material, plant, and equipment to prosecute the Work with diligence to ensure completion thereof within the time specified in the Contract Documents, and shall pay when due any laborer, Subcontractor of any tier, or supplier.

3.4.2 The Contractor, if an individual, shall give the Work an adequate amount of personal supervision, and if a partnership or corporation or joint venture the Work shall be given an adequate amount of personal supervision by a partner or executive officer, as determined by the Owner's Representative.

3.4.3 The Contractor and each of its Subcontractors of any tier shall submit to the Owner such schedules of quantities and costs, progress schedules in accordance

with 3.17.2 of this document, payrolls, reports, estimates, records, and other data as the Owner may request concerning Work performed or to be performed under the Contract.

3.4.4 The Contractor shall be represented at the site by a competent superintendent from the beginning of the Work until its final acceptance, whenever contract work is being performed, unless otherwise permitted in writing by the Owner's Representative. The superintendent for the Contractor shall exercise general supervision over the Work and such superintendent shall have decision making authority of the Contractor. Communications given to the superintendent shall be binding as if given to the Contractor. The superintendent shall not be changed by the contractor without approval from the Owner's Representative.

3.4.5 The Contractor shall establish and maintain a permanent benchmark to which access may be had during progress of the Work, and Contractor shall establish all lines and levels, and shall be responsible for the correctness of such. Contractor shall be fully responsible for all layout work for the proper location of Work in strict accordance with the Contract Documents.

3.4.6 The Contractor shall establish and be responsible for wall and partition locations. If applicable, separate contractors shall be entitled to rely upon these locations and for setting their sleeves, openings, or chases.

3.4.7 The Contractor's scheduled outage/tie-in plan, time, and date for any utilities is subject to approval by the Owner's Representative. Communication with the appropriate entity and planning for any scheduled outage/tie-in of utilities shall be the responsibility of the Contractor. Failure of Contractor to comply with the provisions of this Paragraph shall cause Contractor to forfeit any right to an adjustment of the Contract Sum or Contract Time for any postponement, rescheduling or other delays ordered by Owner in connection with such Work. The Contractor shall follow the following procedures for all utility outages/tie-ins or disruption of any building system:

- .1** All shutting of valves, switches, etc., shall be by the Owner's personnel.
- .2** Contractor shall submit its preliminary outage/tie-in schedule with its baseline schedule.
- .3** The Contractor shall request an outage/tie-in meeting at least two weeks before the outage/tie-in is required.
- .4** The Owner's Representative will schedule an outage/tie-in meeting at least one week prior to the outage/tie-in.

3.4.8 The Contractor shall coordinate all Work so there shall be no prolonged interruption of existing utilities, systems, and equipment of Owner. Any existing plumbing, heating, ventilating, air conditioning, or electrical disconnection necessary, which affect portions of this construction or building or any other building, must be scheduled with the Owner's Representative to avoid any

disruption of operation within the building under construction or other buildings or utilities. In no case shall utilities be left disconnected at the end of a workday or over a weekend. Any interruption of utilities, either intentionally or accidentally, shall not relieve the Contractor from repairing and restoring the utility to normal service. Repairs and restoration shall be made before the workers responsible for the repair and restoration leave the job.

3.4.9 The Contractor shall be responsible for repair of damage to property on or off the project occurring during construction of project, and all such repairs shall be made to meet code requirements or to the satisfaction of the Owner's Representative if code is not applicable.

3.4.10 The Contractor shall be responsible for all shoring required to protect its work or adjacent property and shall pay for any damage caused by failure to shore or by improper shoring or by failure to give proper notice. Shoring shall be removed only after completion of permanent supports.

3.4.11 The Contractor shall maintain at his own cost and expense, adequate, safe and sufficient walkways, platforms, scaffolds, ladders, hoists and all necessary, proper, and adequate equipment, apparatus, and appliances useful in carrying on the Work and which are necessary to make the place of Work safe and free from avoidable danger for students, faculty, staff, the public and construction personnel, and as may be required by safety provisions of applicable laws, ordinances, rules regulations and building and construction codes.

3.4.12 During the performance of the Work, the Contractor shall be responsible for providing and maintaining warning signs, lights, signal devices, barricades, guard rails, fences, and other devices appropriately located on site which shall give proper and understandable warning to all persons of danger of entry onto land, structure, or equipment, within the limits of the Contractor's work area.

3.4.13 The Contractor shall pump, bail, or otherwise keep any general excavations free of water. The Contractor shall keep all areas free of water before, during and after concrete placement. The Contractor shall be responsible for protection, including weather protection, and proper maintenance of all equipment and materials installed, or to be installed by him.

3.4.14 The Contractor shall be responsible for care of the Work and must protect same from damage of defacement until acceptance by the Owner. All damaged or defaced Work shall be repaired or replaced to the Owner's satisfaction, without cost to the Owner.

3.4.15 When requested by the Owner's Representative, the Contractor, at no extra charge, shall provide scaffolds

or ladders in place as may be required by the Architect or the Owner for examination or inspection of Work in progress or completed.

3.4.16 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors of any tier and their agents and employees, and any entity or other persons performing portions of the Work.

3.4.17 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Owner's Representative or Architect in their administration of the Contract, or by tests, inspections or approvals required or performed by persons other than the Contractor.

3.4.18 The Contractor shall be responsible for inspection of portions of the Work already performed under this Contract to determine that such portions are compliant and in proper condition to receive subsequent Work.

3.5 Use of Site

3.5.1 The Contractor shall limit operations and storage of material to the area within the Work limit lines shown on Drawings, except as necessary to connect to existing utilities, shall not encroach on neighboring property, and shall exercise caution to prevent damage to existing structures.

3.5.2 Only materials and equipment, which are to be used directly in the Work, shall be brought to and stored on the Work site by the Contractor. After equipment is no longer required for the Work, it shall be promptly removed from the Work site. Protection of construction materials and equipment stored at the Work site from weather, theft, damage and all other adversity is solely the responsibility of the Contractor.

3.5.3 No project signs shall be erected without the written approval of the Owner's Representative.

3.5.4 The Contractor shall ensure that the Work is at all times performed in a manner that affords reasonable access, both vehicular and pedestrian, to the site of the Work and all adjacent areas. Particular attention shall be paid to access for emergency vehicles, including fire trucks. Wherever there is the possibility of interfering with normal emergency vehicle operations, Contractor shall obtain permission from both campus and municipal emergency response entities prior to limiting any access. 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. Without limitation of any other provision of the Contract Documents, Contractor shall not interfere with the occupancy or beneficial use of (1) any areas and buildings adjacent to the site of the Work or (2) the Work in the event of partial occupancy. Contractor shall assume full responsibility for any damage to the property

comprising the Work or to the owner or occupant of any adjacent land or areas resulting from the performance of the Work.

3.5.5 The Contractor shall not permit any workers to use any existing facilities at the Work site, including, without limitation, lavatories, toilets, entrances, and parking areas other than those designated by Owner. The Contractor, Subcontractors of any tier, suppliers and employees shall comply with instructions or regulations of the Owner's Representative governing access to, operation of, and conduct while in or on the premises and shall perform all Work required under the Contract Documents in such a manner as not to unreasonably interrupt or interfere with the conduct of Owner's operations. Any request for Work, a suspension of Work or any other request or directive received by the Contractor from occupants of existing buildings shall be referred to the Owner's Representative for determination.

3.5.6 The Contractor and the Subcontractor of any tier shall have its' name, acceptable abbreviation or recognizable logo and the name of the city and state of the mailing address of the principal office of the company, on each motor vehicle and motorized self-propelled piece of equipment which is used in connection with the project. The signs are required on such vehicles during the time the Contractor is working on the project.

3.6 Review of Contract Documents and Field Conditions by Contractor

3.6.1 The Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by the Architect and Owner and shall at once report in writing to the Architect and Owner's Representative any errors, inconsistencies or omissions discovered. If the Contractor performs any construction activity which it knows or should have known involves a recognized error, inconsistency, or omission in the Contract Documents without such written notice to the Architect and Owner's Representative, the Contractor shall assume appropriate responsibility for such performance and shall bear an appropriate amount of the attributable costs for correction.

3.6.2 The Contractor shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to the Contractor with the Contract Documents before commencing activities. Errors, inconsistencies, or omissions discovered shall be reported in writing to the Architect and Owner's Representative within twenty-four (24) hours. During the progress of work, Contractor shall verify all field measurements prior to fabrication of building components or equipment and proceed with the fabrication to meet field conditions. Contractor shall consult all Contract Documents to determine the exact location of all work and verify spatial relationships of all work. Any question concerning said

location or spatial relationships shall be submitted to the Owner's Representative. Specific locations for equipment, pipelines, ductwork and other such items of work, where not dimensioned on plans, shall be determined in consultation with Owner's Representative and Architect. Contractor shall be responsible for the proper fitting of the Work in place.

3.6.3 The Contractor shall provide, at the proper time, such material as required for support of the Work. If openings or chases are required, whether shown on Drawings or not, the Contractor shall see they are properly constructed. If required openings or chases are omitted, the Contractor shall cut them at the Contractors own expense, but only as directed by the Architect, through the Owner Representative.

3.6.4 Should the Contract Documents fail to particularly describe materials or goods to be used, it shall be the duty of the Contractor to inquire of the Architect and the Owner's Representative what is to be used and to supply it at the Contractor's expense, or else thereafter replace it to the Owner's Representative's satisfaction. At a minimum, the Contractor shall provide the quality of materials as generally specified throughout the Contract Documents.

3.7 Cleaning and Removal

3.7.1 The Contractor shall keep the Work site and surrounding areas free from accumulation of waste materials, rubbish, debris, and dirt resulting from the Work and shall clean the Work site and surrounding areas as requested by the Architect and the Owner's Representative, including mowing of grass greater than 6 inches high. The Contractor shall be responsible for the cost of clean up and removal of debris from premises. The building and premises shall be kept clean, safe, in a workmanlike manner, and in compliance with OSHA standards and code at all times. At completion of the Work, the Contractor shall remove from and about the Work site tools, construction equipment, machinery, fencing, and surplus materials. Further, at the completion of the work, all dirt, stains, and smudges shall be removed from every part of the building, all glass in doors and windows shall be washed, and entire Work shall be left broom clean in a finished state ready for occupancy. The Contractor shall advise his Subcontractors of any tier of this provision, and the Contractor shall be fully responsible for leaving the premises in a finished state ready for use to the satisfaction of the Owner's Representative. If the Contractor fails to comply with the provisions of this paragraph, the Owner may do so, and the cost thereof shall be charged to the Contractor.

3.8 Cutting and Patching

3.8.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly.

3.8.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter

such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

3.8.3 If the Work involves renovation and/or alteration of existing improvements, Contractor acknowledges that cutting and patching of the Work is essential for the Work to be successfully completed. Contractor shall perform any cutting, altering, patching, and/or fitting of the Work necessary for the Work and the existing improvements to be fully integrated and to present the visual appearance of an entire, completed, and unified project. In performing any Work which requires cutting or patching, Contractor shall use its best efforts to protect and preserve the visual appearance and aesthetics of the Work to the reasonable satisfaction of both the Owner's Representative and Architect.

3.9 Indemnification

3.9.1 To the fullest extent permitted by law, the Contractor shall defend, indemnify, and hold harmless the Owner, the Architect, Architect's consultants, and the agents, employees, representatives, insurers and re-insurers of any of the foregoing (hereafter collectively referred to as the "Indemnitees") from and against claims, damages (including loss of use of the Work itself), punitive damages, penalties and civil fines unless expressly prohibited by law, losses and expenses, including, but not limited to, attorneys' fees, arising out of or resulting from performance of the Work to the extent caused in whole or in part by negligent acts or omissions or other fault of Contractor, a Subcontractor of any tier, or anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by the negligent acts or omissions or other fault of a party indemnified hereunder. The Contractor's obligations hereunder are in addition to and shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that the Owner may possess. If one or more of the Indemnitees demand performance by the Contractor of obligations under this paragraph or other provisions of the Contract Documents and if Contractor refuses to assume or perform, or delays in assuming or performing Contractor's obligations, Contractor shall pay each Indemnitee who has made such demand its respective attorneys' fees, costs, and other expenses incurred in enforcing this provision. The defense and indemnity required herein shall be a binding obligation upon Contractor whether or not an Indemnitee has made such demand. Even if a defense is successful to a claim or demand for which Contractor is obligated to indemnify the Indemnitees from under this Paragraph, Contractor shall remain liable for all costs of defense.

3.9.2 The indemnity obligations of Contractor under this Section 3.9 shall survive termination of this Contract or final payment thereunder. In the event of any claim or demand made against any party which is entitled to be indemnified hereunder, the Owner may in its sole discretion reserve, return or apply any monies due or to become due the Contractor under the Contract for the purpose of resolving such claims; provided, however, that the Owner may release such funds if the Contractor provides the Owner with reasonable assurance of protection of the Owner's interests. The Owner shall in its sole discretion determine if such assurances are reasonable. Owner reserves the right to control the defense and settlement of any claim, action or proceeding which Contractor has an obligation to indemnify the Indemnitees against under Paragraph 3.9.1.

3.9.3 In claims against any person or entity indemnified under this Section 3.9 by an employee of the Contractor, a Subcontractor of any tier, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under this Section 3.9 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor of any tier under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.

3.9.4 The obligations of the Contractor under Paragraph 3.9.1 shall not extend to the liability of the Architect, his agents or employees, arising out of the preparation and approval of maps, drawings, opinions, reports, surveys, Change Orders, designs, or Specifications.

3.10 Patents

3.10.1 The Contractor shall hold and save harmless the Owner and its officers, agents, servants, and employees from liability of any nature or kind, including cost and expense, for, or on account of, any patented or otherwise protected invention, process, article, or appliance manufactured or used in the performance of the Contract, including its use by the Owner, unless otherwise specifically stipulated in the Contract Documents.

3.10.2 If the Contractor uses any design, device, or material covered by letters patent or copyright, he shall provide for such use by suitable agreement with the Owner of such patented or copyrighted design, device, or material. It is mutually agreed and understood, without exception, that the Contract Sum include, and the Contractor shall pay all royalties, license fees or costs arising from the use of such design, device, or material in any way involved in the Work. The Contractor and/or sureties shall indemnify and save harmless the Owner from any and all claims for infringement by reason of the use of such patented or copyrighted design, device, or material or any trademark or copyright in connection with Work agreed to be performed under this Contract and shall indemnify the Owner for any cost, expense, or damage it may be obligated to pay by reason of

such infringement at any time during the prosecution of the Work or after completion of the Work.

3.11 Delegated Design

3.11.1 If the Contract Documents specify the Contractor is responsible for the design of any work as part of the project, then the Contractor shall procure all design services and certifications necessary to complete the Work as specified, from a design professional licensed in the State of Missouri. The signature and seal of that design professional shall appear on all drawings, calculations, specifications, certifications, shop drawings, and other submittals related to the Work. The design professional shall maintain insurance as required per Article 11.

3.12 Materials, Labor, and Workmanship

3.12.1 Materials and equipment incorporated into the Work shall strictly conform to the Contract Documents and representations and approved Samples provided by Contractor and shall be of the most suitable grade of their respective kinds for their respective uses and shall be fit and sufficient for the purpose intended, merchantable, of good new material and workmanship, and free from defect. Workmanship shall be in accordance with the highest standard in the industry and free from defect in strict accordance with the Contract Documents.

3.12.2 Materials and fixtures shall be new and of latest design unless otherwise specified and shall provide the most efficient operating and maintenance costs to the Owner. All Work shall be performed by competent workers and shall be of best quality.

3.12.3 The Contractor shall carefully examine the Contract Documents and shall be responsible for the proper fitting of his material, equipment, and apparatus into the building.

3.12.4 The Contractor shall base his bid only on the Contract Documents.

3.12.5 Materials and workmanship shall be subject to inspection, examination, and testing by the Architect and the Owner's Representative at any and all times during manufacture, installation, and construction of any of them, at places where such manufacture, installation, or construction is performed.

3.12.6 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them.

3.12.7 Unless otherwise specifically noted, the Contractor shall provide and pay for supervision, labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other

facilities and services necessary for the proper execution and completion of the Work.

3.12.8 Substitutions

3.12.8.1 A substitution is a Contractor proposal of an alternate product or method in lieu of what has been specified or shown in the Contract Documents, which is not an "or equal" as set forth in Section 3.12.1.

3.12.8.2 Contractor may make a proposal to the Architect and the Owner's Representative to use substitute products or methods as set forth herein, but the Architect's and the Owner's Representative's decision concerning acceptance of a substitute shall be final. The Contractor must do so in writing and setting forth the following:

- .1** Full explanation of the proposed substitution and submittal of all supporting data including technical information, catalog cuts, warranties, test results, installation instructions, operating procedures, and other like information necessary for a complete evaluation of the substitution.
- .2** Reasons the substitution is advantageous and necessary, including the benefits to the Owner and the Work in the event the substitution is acceptable.
- .3** The adjustment, if any, in the Contract Sum, in the event the substitution is acceptable.
- .4** The adjustment, if any, in the time of completion of the Contract and the construction schedule in the event the substitution is acceptable.
- .5** An affidavit stating that (a) the proposed substitution conforms to and meets all of the Contract Document requirements and is code compliant, except as specifically disclosed and set forth in the affidavit and (b) the Contractor accepts the warranty and correction obligations in connection with the proposed substitution as if originally specified by the Architect. Proposals for substitutions shall be submitted to the Architect and Owner's Representative in sufficient time to allow the Architect and Owner's Representative no less than ten (10) working days for review. No substitution will be considered or allowed without the Contractor's submittal of complete substantiating data and information as stated herein.

3.12.8.3 Substitutions may be rejected without explanation at the Owner's sole discretion and will be considered only under one or more of the following conditions:

- .1** Required for compliance with interpretation of code requirements or insurance regulations then existing;
- .2** Unavailability of specified products, through no fault of the Contractor;
- .3** Material delivered fails to comply with the Contract Documents;
- .4** Subsequent information discloses inability of specified products to perform properly or to fit in designated space;

- .5 Manufacturer/fabricator refuses to certify or guarantee performance of specified product as required; or
- .6 When in the judgment of the Owner or the Architect, a substitution would be substantially to the Owner's best interests, in terms of cost, time, or other considerations.

3.12.8.4 Whether or not any proposed substitution is accepted by the Owner or the Architect, the Contractor shall reimburse the Owner for any fees charged by the Architect or other consultants for evaluating each proposed substitution.

3.13 Approved Equal

3.13.1 Whenever in the Contract Documents any article, appliance, device, or material is designated by the name of a manufacturer, vendor, or by any proprietary or trade name, the words "or approved equal," shall automatically follow and shall be implied unless specifically indicated otherwise. The standard products of manufacturers other than those specified will be accepted when, prior to the ordering or use thereof, it is proven to the satisfaction of the Owner's Representative and the Architect they are equal in design, appearance, spare parts availability, strength, durability, usefulness, serviceability, operation cost, maintenance cost, and convenience for the purpose intended. Any general listings of approved manufacturers in any Contract Document shall be for informational purposes only and it shall be the Contractor's sole responsibility to ensure that any proposed "or equal" complies with the requirements of the Contract Documents and is code compliant.

3.13.2 The Contractor shall submit to Architect and Owner's Representative a written and full description of the proposed "or equal" including all supporting data, including technical information, catalog cuts, warranties, test results, installation instructions, operating procedures, and similar information demonstrating that the proposed "or equal" strictly complies with the Contract Documents. The Architect or Owner's Representative shall take appropriate action with respect to the submission of a proposed "or equal" item. If Contractor fails to submit proposed "or equals" as set forth herein, it shall waive any right to supply such items. The Contract Sum and Contract Time shall not be adjusted as a result of any failure by Contractor to submit proposed "or equals" as provided for herein. All documents submitted in connection with preparing an "or equal" shall be clearly and obviously marked as a proposed "or equal" submission.

3.13.3 No approvals or action taken by the Architect or Owner's Representative shall relieve Contractor from its obligation to ensure that an "or equal" article, appliance, device, or material strictly complies with the requirements of the Contract Documents. Contractor shall not propose "or equal" items in connection with Shop Drawings or

other Submittals, and Contractor acknowledges and agrees that no approvals or action taken by the Architect or Owner's Representative with respect to Shop Drawings or other Submittals shall constitute approval of any "or equal" item or relieve Contractor from its sole and exclusive responsibility. Any changes required in the details and dimensions indicated in the Contract Documents for the incorporation or installation of any "or equal" item supplied by the Contractor shall be properly made and approved by the Architect at the expense of the Contractor. No 'or equal' items will be permitted for components of or extensions to existing systems when, in the opinion of the Architect, the named manufacturer must be provided in order to ensure compatibility with the existing systems, including, but not limited to, mechanical systems, electrical systems, fire alarms, smoke detectors, etc. No action will be taken by the Architect with respect to proposed "or equal" items prior to receipt of bids, unless otherwise noted in the Special Conditions.

3.14 Shop Drawings, Product Data, Samples, and Coordination Drawings/BIM Models

3.14.1 Shop Drawings are drawings, diagrams, schedules, and other data specifically prepared for the Work by the Contractor or a Subcontractor, sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

3.14.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

3.14.3 Samples are physical samples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

3.14.4 Coordination Drawings are drawings for the integration of the Work, including work first shown in detail on shop drawings or product data. Coordination drawings show sequencing and relationship of separate units of work which must interface in a restricted manner to fit in the space provided, or function as indicated. Coordination Drawings are the responsibility of the contractor and are submitted for informational purposes. The Special Conditions will state whether coordination drawings are required. BIM models may be used for coordination in lieu of coordination drawings at the contractor's discretion, unless required in the Special Conditions. The final coordination drawings/BIM Model will not change the contract documents, unless approved by a fully executed change order describing the specific modifications that are being made to the contract documents.

3.14.5 Shop Drawings, Coordination Drawings/BIM Models, Product Data, Samples and similar submittals (collectively referred to as "Submittals") are not Contract Documents. The purpose of their submittal is to demonstrate for those portions of the Work for which submittals are

required the way the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents.

3.14.6 The Contractor shall schedule submittal of Shop Drawings and Product Data to the Architect so that no delays will result in delivery of materials and equipment, advising the Architect of priority for checking of Shop Drawings and Product Data, but a minimum of two weeks shall be provided for this purpose. Because time is of the essence in this contract, unless noted otherwise in the Special Conditions or Technical Specifications, all submittals, shop drawings and samples must be submitted as required to maintain the contractor's plan for proceeding but must be submitted within 90 days of the Notice to Proceed. If Contractor believes that this milestone is unreasonable for any submittal, Contractor shall request an extension of this milestone, within 60 days of Notice to Proceed, for each submittal that cannot meet the milestone. The request shall contain a reasonable explanation as to why the 90-day milestone is unrealistic, and shall specify a date on which the submittal will be provided, for approval by the Owner's Representative. Failure of the Contractor to comply with this section may result in delays in the submittal approval process and/or charges for expediting approval, both of which will be the responsibility of the Contractor.

3.14.7 The Contractor, at its own expense, shall submit Samples required by the Contract Documents with reasonable promptness as to cause no delay in the Work or the activities of separate contractors and no later than twenty (20) days before materials are required to be ordered for scheduled delivery to the Work site. Samples shall be labeled to designate material or products represented, grade, place of origin, name of producer, name of Contractor and the name and number of the Owner's project. Quantities of Samples shall be twice the number required for testing so that Architect can return one set of the Samples. Materials delivered before receipt of Architect's approval may be rejected by Architect and in such event, Contractor shall immediately remove all such materials from the Work site. When requested by Architect or Owner's Representative, samples of finished masonry and field applied paints and finishes shall be located as directed and shall include sample panels built at the site of approximately twenty (20) square feet each.

3.14.8 The Contractor shall perform no portion of the Work requiring submittal and review of Shop Drawings, Product Data, Samples, or similar submittals until the respective submittal has been approved by the Architect. Such Work shall be in accordance with approved submittals.

3.14.9 By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents such Submittals strictly comply with the requirements of the Contract Documents and that the

Contractor has determined and verified field measurements and field construction criteria related thereto, that materials are fit for their intended use and that the fabrication, shipping, handling, storage, assembly and installation of all materials, systems and equipment are in accordance with best practices in the industry and are in strict compliance with any applicable requirements of the Contract Documents. Contractor shall also coordinate each Submittal with other Submittals.

3.14.10 Contractor shall be responsible for the correctness and accuracy of the dimensions, measurements and other information contained in the Submittals.

3.14.11 Each Submittal will bear a stamp or specific indication that the Submittal complies with the Contract Documents and Contractor has satisfied its obligations under the Contract Documents with respect to Contractor's review and approval of that Submittal. Each Submittal shall bear the signature of the representative of Contractor who approved the Submittal, together with the Contractor's name, Owner's name, number of the Project, and the item name and specification section number.

3.14.12 The Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals by the Architect's approval thereof. Specifically, but not by way of limitation, Contractor acknowledges that Architect's approval of Shop Drawings shall not relieve Contractor for responsibility for errors and omissions in the Shop Drawings since Contractor is responsible for the correctness of dimensions, details and the design of adequate connections and details contained in the Shop Drawings.

3.14.13 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous Submittals.

3.14.14 The Contractor represents and warrants that all Shop Drawings shall be prepared by persons and entities possessing expertise and experience in the trade for which the Shop Drawing is prepared and, if required by the Architect or applicable Laws, by a licensed engineer or other design professional.

3.15 Record Drawings

3.15.1 The Contractor shall maintain a set of Record Drawings on site in good condition and shall use colored pencils to mark up said set with "record information" in a legible manner to show: (1) bidding addendums, (2) executed change orders, (3) deviations from the Drawings made during construction; (4) details in the Work not previously shown; (5) changes to existing conditions or existing conditions found to differ from those shown on any existing drawings; (6) the actual installed position of equipment, piping, conduits, light switches, electric fixtures, circuiting, ducts, dampers, access

panels, control valves, drains, openings, and stub-outs; and (7) such other information as either Owner or Architect may reasonably request. The prints for Record Drawing use will be a set of "blue line" prints provided by Architect to Contractor at the start of construction. Upon Substantial Completion of the Work, Contractor shall deliver all Record Drawings to Owner and Architect for approval. If not approved, Contractor shall make the revisions requested by Architect or Owner's Representative. Final payment and any retainage shall not be due and owing to Contractor until the final Record Drawings marked by Contractor as required above are delivered to Owner.

3.16 Operating Instructions and Service Manuals

3.16.1 The Contractor shall submit four (4) volumes of operating instructions and service manuals to the Architect before completing 50% of the adjusted contract amount. Payments beyond 50% of the adjusted contract amount may be withheld until all operating instructions and service manuals are received. The operating instructions and service manuals shall contain:

- .1** Start-up and Shutdown Procedures: Provide a step-by-step write up of all major equipment. When manufacturer's printed start-up, trouble shooting and shut-down procedures are available, they may be incorporated into the operating manual for reference.
- .2** Operating Instructions: Written operating instructions shall be included for the efficient and safe operation of all equipment.
- .3** Equipment List: List of all major equipment as installed shall include model number, capacities, flow rate, and name-plate data.
- .4** Service Instructions: The Contractor shall be required to provide the following information for all pieces of equipment.
 - (a)** Recommended spare parts including catalog number and name of local suppliers or factory representative.
 - (b)** Belt sizes, types, and lengths.
 - (c)** Wiring diagrams.
- .5** Manufacturer's Certificate of Warranty: Manufacturer's certificates of warranty shall be obtained for all major equipment. Warranty shall be obtained for at least one year from the date of Substantial Completion. Where longer period is required by the Contract Documents, the longer period shall govern.
- .6** Parts catalogs: For each piece of equipment furnished, a parts catalog or similar document shall be provided which identifies the components by number for replacement ordering.

3.16.2 Submission

- .1** Manuals shall be bound into volumes of standard 8 1/2" x 11" hard binders. Large drawings too bulky to be folded into 8 1/2" x 11" shall be separately bound or folded and in brown

envelopes, cross-referenced and indexed with the manuals.

- .2** The manuals shall identify the Owner's project name, project number, and include the name and address of the Contractor and major Subcontractors of any tier who were involved with the activity described in that particular manual.

3.17 Taxes

3.17.1 The Contractor shall pay all applicable sales, consumer, use, and similar taxes for the Work which are legally enacted when the bids are received, whether or not yet effective or scheduled to go into effect. However, certain purchases by the Contractor of materials incorporated in or consumed in the Work are exempt from certain sales tax pursuant to RSMo § 144.062. The Contractor shall be issued a Project Tax Exemption Certificate for this Work to obtain the benefits of RSMo § 144.062.

3.17.2 The Contractor shall furnish this certificate to all subcontractors, and any person or entity purchasing materials for the Work shall present such certificate to all material suppliers as authorization to purchase, on behalf of the Owner, all tangible personal property and materials to be incorporated into or consumed in the Work and no other on a tax-exempt basis. Such suppliers shall provide to the purchasing party invoices bearing the name of the exempt entity and the project identification number. Nothing in this section shall be deemed to exempt from any sales or similar tax the purchase of any construction machinery, equipment or tools used in construction, repairing or remodeling facilities for the Owner. All invoices for all personal property and materials purchased under a Project Tax Exemption Certificate shall be retained by the Contractor for a period of five years and shall be subject to audit by the Director of Revenue.

3.17.3 Any excess resalable tangible personal property or materials which were purchased for the project under this Project Tax Exemption Certificate but which were not incorporated into or consumed in the Work shall either be returned to the supplier for credit or the appropriate sales or use tax on such excess property or materials shall be reported on a return and paid by such purchasing party not later than the due date of the purchasing party's Missouri sales or use tax return following the month in which it was determined that the materials were not used in the Work.

3.17.4 If it is determined that sales tax is owed by the Contractor on property and materials due to the failure of the Owner to revise the certificate expiration date to cover the applicable date of purchase, Owner shall be liable for the tax owed.

3.17.5 The Owner shall not be responsible for any tax liability due to Contractor's neglect to make timely orders, payments, etc. or Contractor's misuse of the Project Tax Exemption Certificate. Contractor represents that the Project Tax Exemption Certificate shall be used in accordance with RSMo § 144.062 and the terms of the Project Tax Exemption

Certificate. Contractor shall indemnify the Owner for any loss or expense, including but not limited to, reasonable attorneys' fees, arising out of Contractor's use of the Project Tax Exemption Certificate.

3.18 Contractor's Construction Schedules

3.18.1 The Contractor, within fifteen (15) days after the issuance of the Notice to Proceed, shall prepare and submit for the Owner's and Architect's information Contractor's construction schedule for the Work and shall set forth interim dates for completion of various components of the Work and Work Milestone Dates as defined herein. The schedule shall not exceed time limits current under the Contract Documents, shall be revised on a monthly basis or as requested by the Owner's Representative as required by the conditions of the Work, and shall provide for expeditious and practicable execution of the Work. The Contractor shall conform to the most recent schedule.

3.18.2 The construction schedule shall be in a detailed format satisfactory to the Owner's Representative and the Architect and in accordance with the detailed schedule requirements set forth in this document and the Special Conditions. If the Owner's Representative or Architect has a reasonable objection to the schedule submitted by Contractor, the construction schedule shall be promptly revised by the Contractor. 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.

3.18.3 As time is of the essence to this contract, the University expects that the Contractor will take all necessary steps to ensure that the project construction schedule shall be prepared in accordance with the specific requirements of the Special Conditions to this contract. At a minimum, contractor shall comply with the following:

- .1** The schedule shall be prepared using Primavera P3, Oracle P6, Microsoft Project or other software acceptable to the Owner's Representative.
- .2** The schedule shall be prepared and maintained in CPM format, in accordance with Construction CPM Scheduling, published by the Associated General Contractors of American (AGC).
- .3** Prior to submittal to the Owner's Representative for review, Contractor shall obtain full buy-in to the schedule from all major subcontractors, in writing if so, requested by Owner's Representative.
- .4** Schedule shall be updated, in accordance with Construction CPM Scheduling, published by the AGC, on a monthly basis at minimum, prior to, and submitted with, the monthly pay application or as requested by the Owner's Representative.
- .5** Along with the update the Contractor shall submit a narrative report addressing all changes, delays and impacts, including weather to the schedule

during the last month, and explain how the end date has been impacted by same.

- .6** The submission of the updated schedule certifies that all delays and impacts that have occurred on or to the project during the previous month have been factored into the update and are fully integrated into the schedule and the projected completion date.

Failure to comply with any of these requirements will be considered a material breach of this contract. See Special Conditions for detailed scheduling requirements.

3.18.4 In the event the Owner's Representative or Architect determines that the performance of the Work, as of a Milestone Date, has not progressed or reached the level of completion required by the Contract Documents, the Owner shall have the right to order the Contractor to take corrective measures necessary to expedite the progress of construction, including, without limitation, (1) working additional shifts or overtime, (2) supplying additional manpower, equipment, facilities, (3) expediting delivery of materials, and (4) other similar measures (hereinafter referred to collectively as Extraordinary Measures). Such Extraordinary Measures shall continue until the progress of the Work complies with the stage of completion required by the Contract Documents. The Owner's right to require Extraordinary Measures is solely for the purpose of ensuring the Contractor's compliance with the construction schedule. The Contractor shall not be entitled to an adjustment in the Contract Sum concerning Extraordinary Measures required by the Owner under or pursuant to this Paragraph 3.17.3. The Owner may exercise the rights furnished the Owner under or pursuant to this Paragraph 3.17.3 as frequently as the Owner deems necessary to ensure that the Contractor's performance of the Work will comply with any Milestone Date or completion date set forth in the Contract Documents.

ARTICLE 4

ADMINISTRATION OF THE CONTRACT

4.1 Rights of the Owner

4.1.1 The Owner's Representative will administer the Construction Contract. The Architect will assist the Owner's Representative with the administration of the Contract as indicated in these Contract Documents.

4.1.2 If, in the judgment of the Owner's Representative, it becomes necessary to accelerate the work, the Contractor, when directed by the Owner's Representative in writing, shall cease work at any point and transfer its workers to such point or points and execute such portions of the work as may be required to enable others to hasten and properly engage and carry out the work, all as directed by the Owner's Representative. The additional cost of accelerating the work, if any, will be borne by the Owner, unless the Contractor's work progress is behind schedule as shown on the most recent progress schedule.

4.1.3 If the Contractor refuses, for any reason, to proceed with what the Owner believes to be contract work, the Owner may issue a Construction Directive, directing the Contractor to proceed. Contractor shall be obligated to promptly proceed with this work. If Contractor feels that it is entitled to additional compensation for this work, it may file a claim for additional compensation and/or time, in accordance with 4.4 of this Document.

4.1.4 The Owner's Representative, may, by written notice, require a Contractor to remove from involvement with the Work, any of Contractor's personnel or the personnel of its Subcontractors of any tier whom the Owner's Representative may deem abusive, incompetent, careless, or a hindrance to proper and timely execution of the Work. The Contractor shall comply with such notice promptly, but without detriment to the Work or its progress.

4.1.5 The Owner's Representative will schedule Work status meetings that shall be attended by representatives of the Contractor and appropriate Subcontractors of any tier. Material suppliers shall attend status meetings if required by the Owner's Representative. These meetings shall include preconstruction meetings.

4.1.6 The Owner does not allow smoking on university property.

4.2 Rights of the Architect

4.2.1 The Architect will interpret requirements of the Contract Documents with respect to the quality, quantity, and other technical requirements of the Work itself within a reasonable time after written request of the Contractor. Contractor shall provide Owner's Representative a copy of such written request.

4.3 Review of the Work

4.3.1 The Architect, the Owner's Representative, and the Owner's Authorized Agent shall, at all times, have access to the Work; and the Contractor shall provide proper and safe facilities for such access.

4.3.2 The Owner's Representative shall have authority to reject Work that does not strictly comply with the requirements of the Contract Documents. Whenever the Owner's Representative considers it necessary or advisable for implementation of the intent of the Contract Documents, Owner's Representative shall have the authority to require additional inspection or testing of the Work, whether or not such Work is fabricated, installed, or completed.

4.3.3 The fact that the Architect or the Owner's Representative observed, or failed to observe, faulty Work, or Work done which is not in accordance with the Contract Documents, regardless of whether or not the Owner has released final payment, shall not relieve the

Contractor from responsibility for all damages and additional costs of the Owner as a result of defective or faulty Work.

4.4 Claims

4.4.1 A Claim is a demand or assertion by Contractor seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of time or any other relief with respect to the terms of the Contract. The term "Claim(s)" also includes demands and assertions of Contractor arising out of or relating to the Contract Documents, including Claims based upon breach of contract, mistake, misrepresentation, or other cause for Contract Modification or rescission. Claims must be made by written notice. Contractor shall have the responsibility to substantiate Claims.

4.4.2 Claims by Contractor must be made promptly, and no later than within fourteen (14) days after occurrence of the event giving rise to such Claim. Claims must be made by written notice. Such notice shall include a detailed statement setting forth all reasons for the Claim and the amount of additional money and additional time claimed by Contractor. The notice of Claims shall also strictly comply with all other provisions of the Contract Documents. Contractor shall not be entitled to rely upon any grounds or basis for additional money on additional time not specifically set forth in the notice of Claim. All Claims not made in the manner provided herein shall be deemed waived and of no effect. Contractor shall furnish the Owner and Architect such timely written notice of any Claim provided for herein, including, without limitation, those in connection with alleged concealed or unknown conditions, and shall cooperate with the Owner and Architect in any effort to mitigate the alleged or potential damages, delay or other adverse consequences arising out of the condition which is the cause of such a Claim.

4.4.3 Pending final resolution of a Claim, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments that are not in dispute in accordance with the Contract Documents.

4.5 Claims for Concealed or Unknown Conditions

4.5.1 If conditions are encountered at the site which are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents, or (2) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then notice by the Contractor shall be given to the Owner's Representative promptly before conditions are disturbed, and in no event later than three (3) days after first observance of the conditions. The Owner's Representative will promptly investigate such conditions. If such conditions differ materially, as provided for above and cause an increase or decrease in the Contractor's cost, or time, required for performance of the Work, an equitable adjustment in the Contract sum or Contract Time, or both, shall be made, subject to the provisions and restrictions set for herein. If the Owner's Representative determines that the

conditions at the site are not materially different from those indicated in the Contract Documents, and that no change in the terms of the Contract is justified, the Owner's Representative will so notify the Contractor in writing. If the Contractor disputes the finding of the Owner's Representative that no change in the terms of the Contract terms is justified, Contractor shall proceed with the Work, taking whatever steps are necessary to overcome or correct such conditions so that Contractor can proceed in a timely manner. The Contractor may have the right to file a Claim in accordance with the Contract Documents.

4.5.2 It is expressly agreed that no adjustment in the Contract Time or Contract Sum shall be permitted, however, in connection with a concealed or unknown condition which does not differ materially from those conditions disclosed or which reasonably should have been disclosed by the Contractor's (1) prior inspections, tests, reviews and preconstruction investigations for the Project, or (2) inspections, tests, reviews and preconstruction inspections which the Contractor had the opportunity to make or should have performed in connection with the Project.

4.6 Claim for Additional Cost

4.6.1 If the Contractor makes a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. In addition to all other requirements for notice of a Claim, said notice shall detail and itemize the amount of all Claims and shall contain sufficient data to permit evaluation of same by Owner.

4.7 Claims for Additional Time

4.7.1 If the Contractor makes a Claim for an increase in the Contract Time, written notice as provided herein shall be given. In addition to other requirements for notice of a Claim, Contractor shall include an estimate of the probable effect of delay upon the progress of the Work, utilizing a CPM Time Impact Schedule Analysis, (TIA) as defined in the AGC Scheduling Manual. In the case of a continuing delay, only one Claim is necessary.

.1 Time extensions will be considered for excusable delays only. That is, delays that are beyond the control and/or contractual responsibility of the Contractor.

4.7.2 If weather days are the basis for a Claim for additional time, such Claim shall be documented by the Contractor by data acceptable to the Owner's Representative substantiating that weather conditions for the period of time in question, had an adverse effect on the critical path of the scheduled construction. Weather days shall be defined as days on which critical path work cannot proceed due to weather conditions (including but not limited to rain, snow, etc.), in excess of the number of days shown on the Anticipated Weather Day schedule in the Special Conditions. To be considered a weather day,

at least four working hours must be lost due to the weather conditions on a critical path scope item for that day.-Weather days and Anticipated weather days listed in the Special Conditions shall only apply to Monday through Friday. A weather day claim cannot be made for Saturdays, Sundays, New Year's Day, Martin Luther King Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the day after Thanksgiving Day and Christmas Day, unless that specific day was approved in writing for work by the Owner's Representative.

.1 The Contractor must have fulfilled its contract obligations with respect to temporary facilities and protection of its work, and worker protection for hot and cold weather per OSHA guidelines.

.2 If the contract obligations have been satisfied, the Owner will review requests for non-compensable time extensions for critical path activities as follows:

.2.1 If the Contractor cannot work on a critical path activity due to adverse weather, after implementing all reasonable temporary weather protection, the Contractor will so notify the Owner's Representative. Each week, the Contractor will notify the Owner's Representative of the number of adverse weather days that it believes it has experienced in the previous week. As provided in the contract, until such time as the weather days acknowledged by the Owner's Representative exceed the number of days of adverse weather contemplated in the Special Conditions, no request for extension of the contract completion time will be considered.

.2.2 If the Contractor has accumulated in excess of the number of adverse weather days contemplated in the Special Conditions due to the stoppage of work on critical path activities due to adverse weather, the Owner will consider a time extension request from the Contractor that is submitted in accordance with the contract requirements. The Owner will provide a change order extending the time for contract completion or direct an acceleration of the work in accordance with the contract terms and conditions to recover the time lost due to adverse weather in excess of the number of adverse weather working days contemplated in the Special Conditions.

4.7.3 A Force Majeure event or circumstance shall not be the basis of a claim by the Contractor seeking an adjustment in the Contract amount for costs or expenses of any type. With the exception of weather delays which are administered under this Article 4, and notwithstanding other requirements of the Contract, all Force Majeure events resulting in a delay

to the critical path of the project shall be administered as provided in Article 8.

4.7.4 The Owner will consider and evaluate requests for time extensions due to changes or other events beyond the control of the Contractor on a monthly basis only, with the submission of the Contractor's updated schedule, in conjunction with the monthly application for payment.

4.8 Resolution of Claims and Disputes

4.8.1 The Owner's Representative will review Claims and take one or more of the following preliminary actions within ten days of receipt of a Claim: (1) request additional supporting data from the Contractor, (2) reject the Claim in whole or in part, (3) approve the Claim, or (4) suggest a compromise.

4.8.2 If a Claim has not been resolved, the Contractor shall, within ten days after the Owner's Representative's preliminary response, take one or more of the following actions: (1) submit additional supporting data requested, (2) modify the initial Claim, or (3) notify the Owner's Representative that the initial Claim stands.

4.8.3 If a Claim has not been resolved after consideration of the foregoing and of further information presented by the Contractor, the Contractor has the right to seek administrative review as set forth in Section 4.9. However, Owner's Representative's decisions on matters relating to aesthetics will be final.

4.9 Administrative Review

4.9.1 Claims not resolved pursuant to the procedures set forth in the Contract Documents except with respect to Owner's Representative's decision on matters relating to aesthetic effect, and except for claims which have been waived by the making or acceptance of final payment, or the Contractor's acceptance of payments in full for changes in work may be submitted to administrative review as provided in this section. All requests for administrative review shall be made in writing.

4.9.2 Upon written request from the Contractor, the Owner's Review Administrator authorized by the Campus Contracting Officer will convene a review meeting between the Contractor and Owner's Representative's within fifteen (15) days of receipt of such written request. The Contractor and Owner's Representative will be allowed to present written documentation with respect to the claim(s) before or during the meeting. The Contractor and Owner's Representative will be allowed to present the testimony of any knowledgeable person regarding the claim at the review meeting. The Owner's Review Administrator will issue a written summary of the review meeting and decision to resolve the Claim within fifteen (15) days. If the Contractor is in agreement with the decision the Contractor shall notify the Owner's Review Administrator in writing within five (5) days, and

appropriate documentation will be signed by the parties to resolve the Claim.

4.9.3 If the Contractor is not in agreement with the proposal of the Owner's Review Administrator as to the resolution of the claim, the Contractor may file a written appeal with the UM System Contracting Officer, [in care of the Director of Facilities Planning and Development, University of Missouri, 109 Old Alumni Centers, University of Missouri, Columbia, Missouri 65211] within fifteen (15) days after receipt of the Owner's Review Administrator's proposal. The UM System Contracting Officer will call a meeting of the Contractor, the Owner's Representative, and the Owner's Review Administrator by written notice, within thirty (30) days after receipt of the Contractor's written appeal. The Owner's Review Administrator shall provide the UM System Contracting Officer with a copy of the written decision and summary of the review meeting, the Contractor's corrections or comments regarding the summary of the review meeting, and any written documentation presented by the Contractor and the Owner's Representative at the initial review meeting. The parties may present further documentation and/or present the testimony of any knowledgeable person regarding the claim at the meeting called by the UM System Contracting Officer.

4.9.4 The UM System Contracting Officer will issue a written decision to resolve the claim within fifteen (15) days after the meeting. If the Contractor is in agreement with the UM System Contracting Officer's proposal, the Contractor shall notify the UM System Contracting Officer in writing within five (5) days, and the Contractor and the Owner shall sign appropriate documents. The issuance of the UM System Contracting Officer's written proposal shall conclude the administrative review process even if the Contractor is not in agreement. However, proposals and any opinions expressed in such proposals issued under this section will not be binding on the Contractor nor will the decisions or any opinions expressed be admissible in any legal actions arising from the Claim and will not be deemed to remove any right or remedy of the Contractor as may otherwise exist by virtue of Contract Documents or law. Contractor and Owner agree that the Missouri Circuit Court for the County where the Work is located shall have exclusive jurisdiction to determine all issues between them. Contractor agrees not to file any complaint, petition, lawsuit or legal proceeding against Owner except with such Missouri Circuit Court.

ARTICLE 5 SUBCONTRACTORS

5.1 Award of Subcontracts

5.1.1 Pursuant to Article 9, the Contractor shall furnish the Owner and the Architect, in writing, with the name, and trade for each Subcontractor and the names of all persons or entities proposed as manufacturers of products, materials and equipment identified in the Contract Documents and where applicable, the name of the installing contractor. The

Owner's Representative will reply to the Contractor in writing if the Owner has reasonable objection to any such proposed person or entity. The Contractor shall not contract with a proposed person or entity to whom the Owner has made reasonable and timely objection.

5.1.2 The Contractor may request to change a subcontractor. Any such request shall be made in writing to the Owner's Representative. The Contractor shall not change a Subcontractor, person, or entity previously disclosed if the Owner makes reasonable objection to such change.

5.1.3 The Contractor shall be responsible to the Owner for acts, defaults, and omissions of its Subcontractors of any tier.

5.2 Subcontractual Relations

5.2.1 By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor of any tier, to the extent of the Work to be performed by the Subcontractor of any tier, to be bound to the Contractor by terms of the Contract Documents and to assume toward the Contractor all the obligations and responsibilities which the Contractor, by these Documents, assumes toward the Owner and the Architect. Each subcontract agreement of any tier shall preserve and protect the rights of the Owner and the Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor of any tier so that subcontracting thereof will not prejudice such rights and shall allow to the Subcontractor of any tier, unless specifically provided otherwise 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 its sub-subcontractors. The Contractor shall make available to each proposed Subcontractor of any tier, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor of any tier shall be bound. Subcontractors of any tier shall similarly make copies of applicable portions of such documents available to their respective proposed Subcontractors of any tier.

5.2.2 All agreements between the Contractor and a Subcontractor or supplier shall contain provisions whereby Subcontractor or supplier waives all rights against the Owner, contractor, Owner's representative, Architect and all other additional insureds for all losses and damages caused by, arising out of, or resulting from any of the perils covered by property or builders risk insurance coverage required of the Contractor in the Contract Documents. If Contractor fails to include said provisions in all subcontracts, Contractor shall indemnify, defend and hold all the above entities harmless in the event of any legal action by Subcontractor or supplier. If insureds on any such policies require separate waiver

forms to be signed by any Subcontractors of any tier or suppliers, Contractor shall obtain the same.

5.3 Contingent Assignment of Subcontract

5.3.1 No assignment by the Contractor of any amount or any part of the Contract or of the funds to be received thereunder will be recognized unless such assignment has had the written approval of the Owner, and the surety has been given due notice of such assignment and has furnished written consent hereto. In addition to the usual recitals in assignment Contracts, the following language must be set forth: "it is agreed that the funds to be paid to the assignee under this assignment are subject to performance by the Contractor of the contract and to claims and to liens for services rendered or materials supplied for the performance of the Work called for in said contract in favor of all persons, firms or corporations rendering such services or supplying such materials."

ARTICLE 6 SEPARATE CONTRACTS AND COOPERATION

6.1 The Owner reserves the right to let other contracts in connection with the Work.

6.2 It shall be the duty of each Contractor to whom Work may be awarded, as well as all Subcontractors of any tier employed by them, to communicate immediately with each other in order to schedule Work, locate storage facilities, etc., in a manner that will permit all Contractors to work in harmony in order that Work may be completed in the manner and within the time specified in the Contract Documents.

6.3 No Contractor shall delay another Contractor by neglecting to perform his work at the proper time. Each Contractor shall be required to coordinate his work with other Contractors to afford others reasonable opportunity for execution of their work. Any costs caused by defective, non-compliant, or ill-timed work, including actual damages and liquidated damages for delay, if applicable, shall be borne by the Contractor responsible therefor.

6.4 Each Contractor shall be responsible for damage to Owner's or other Contractor's property done by him or persons in his employ, through his or their fault or negligence. If any Contractor shall cause damage to any other Contractor, the Contractor causing such damage shall upon notice of any claim, settle with such Contractor.

6.5 The Contractor shall not claim from the Owner money damages or extra compensation under this Contract when delayed in initiating or completing his performance hereunder, when the delay is caused by labor disputes, acts of God, or the failure of any other Contractor to complete his performance under any Contract with the Owner, where any such cause is beyond the Owner's reasonable control.

6.6 Progress schedule of the Contractor for the Work shall be submitted to other Contractors as necessary to permit coordinating their progress schedules.

6.7 If Contractors or Subcontractors of any tier refuse to cooperate with the instructions and reasonable requests of other contractors performing work for the Owner under separate contract, in the overall coordinating of the Work, the Owner's Representative may take such appropriate action and issue such instructions as in his judgement may be required to avoid unnecessary and unwarranted delay.

ARTICLE 7 CHANGES IN THE WORK

7.1 CHANGE ORDERS

7.1.1 A change order is a written instrument prepared by the Owner and signed by the Owner and Contractor formalizing their agreement on the following:

- .1** a change in the Work
- .2** the amount of an adjustment, if any, in the Contract amount
- .3** an adjustment, if any, in the Contract time

7.1.2 The Owner may at any time, order additions, deletions, or revisions in the Work by a Change Order or a Construction Change Directive. Such Change Order or Construction Change Directive shall not invalidate the Contract and requires no notice to the surety. Upon receipt of any such document, or written authorization from the Owner's Representative directing the Contractor to proceed pending receipt of the document, Contractor shall promptly proceed with the Work involved in accordance with the terms set forth therein.

7.1.3 Until such time as the change order is formalized and signed by both the Owner and the Contractor it shall be considered a Change Order Request.

7.1.4 The amount of adjustment in the contract price for authorized Change Orders will be agreed upon before such Change Orders becomes effective and will be determined as follows:

- .1** By a lump sum proposal from the Contractor and the Subcontractors of any tier, including overhead and profit.
- .2** By a time and material basis with or without a specified maximum. The Contractor shall submit to the Owner's Representative itemized time and material sheets depicting labor, materials, equipment utilized in completing the Work on a daily basis for the Owner's Representative approval. If this pricing option is utilized, the Contractor may be required to submit weekly reports summarizing costs to

date on time and material change orders not yet finalized.

- .3** By unit prices contained in the Contractor's original bid and incorporated in the Construction Contract or subsequently agreed upon. Such unit prices contained in the Contractor's original proposal are understood to include the Contractor's overhead and profit. If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are so changed in a proposed Change Order that application of such unit prices to quantities of the Work proposed will cause substantial inequity to the Owner or to the Contractor, the applicable unit prices shall be equitably adjusted.

7.1.5 The Contractor shall submit all fully documented change order requests with corresponding back-up documentation within the time requested by the Owner but no later than fourteen (14) working days following 1.) the Owner's request for change order pricing in the case of a lump sum; or 2.) the completion of unit price or time and material work.

7.1.6 The Contractor shall submit change order requests in sufficient detail to allow evaluation by the Owner. Such requests shall be fully itemized by units of labor, material and equipment and overhead and profit. Such breakdowns shall be itemized as follows:

- .1** Labor: The Contractor's proposal shall include breakdowns by labor, by trade, indicating number of hours and cost per hour for each Subcontractor as applicable. Such breakdowns shall only include employees in the direct employ of Contractor or Subcontractors in the performance of the Work. Such employees shall only include laborers at the site, mechanics, craftsmen and foremen. Payroll cost shall include base rate salaries and wages plus the cost of fringe benefits required by agreement or custom and social security contributions, unemployment, payroll taxes and workers' or workmen's compensation insurance and other customary and legally required taxes paid by the Contractor or Subcontractors. Any item or expense outside of these categories is not allowed. The expense of performing Work after regular working hours, on Saturdays, Sundays or legal holidays shall not be included in the above, unless approved in writing and in advance by Owner.
- .2** Material, supplies, consumables and equipment to be incorporated into the Work at actual invoice cost to the Contractor or Subcontractors; breakdowns showing all material, installed equipment and consumables fully itemized with number of units installed and cost per unit extended. Any singular item or items in aggregate greater than one thousand dollars (\$1,000) in cost shall be supported with supplier invoices at the request of the Owner's Representative. Normal hand tools are not compensable.
- .3** Equipment: Breakdown for required equipment shall itemize (at a minimum) delivery / pick-up charge, hourly

rate and hours used. Operator hours and rate shall not be included in the equipment breakdown. Contractor must use the most cost-effective equipment available in the area and should not exceed the rates listed in the Rental Rate Blue Book for Construction Equipment (Blue Book). Contractor shall submit documentation for the Blue Book to support the rate being requested.

7.2 Construction Change Directive

7.2.1 A construction change directive is a written order prepared and signed by the Owner, issued with supporting documents prepared by the Architect (if applicable), directing a change in the Work prior to agreement on adjustment of the Contract amount or Contract time, or both. A Construction Change Directive shall be used in the absence of complete agreement between the Owner and Contractor on the terms of a change order. If the Construction Change Directive allows an adjustment of the contract amount or time, such adjustment amount shall be based on one of the following methods:

- .1** A lump sum agreement, properly itemized and supported by substantiating documents of sufficient detail to allow evaluation.
- .2** By unit prices contained in the Contractor's original proposal and incorporated in the Construction Contract or subsequently agreed upon.
- .3** A method agreed to by both the Owner and the contractor with a mutually agreeable fee for overhead and profit.
- .4** In the absence of an agreement between the Owner and the Contractor on the method of establishing an adjustment of the contract amount, the Owner, with the assistance of the architect, shall determine the adjustment amount on the basis of expenditures by the Contractor for labor, materials, equipment, and other costs consistent with other provisions of the Contract. The contractor shall keep and submit to the Owner an itemized accounting of all cost components, either expended or saved, while performing the Work covered under the Construction Change Directive.

7.2.2 Upon receipt of a Construction Change Directive, Contractor shall promptly proceed with the change in the Work involved and advise Owner of Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum, Contract Time, or both.

7.2.3 A Construction Change Directive signed by Contractor indicates the agreement of the Contractor therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

7.3 Overhead and Profit

7.3.1 Overhead and Profit on Change Orders shall be applied as follows:

- .1** The overhead and profit charged by the Contractor and Subcontractors shall be considered to include, but not limited to, job site office and clerical expense, normal hand tools, incidental job supervision, field supervision, payroll costs and other compensation for project manager, officers, executives, principals, general managers, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, time-keepers, and other personnel employed whether at the site or in principal or a branch office for general superintendent and administration of the Work.
- .2** The percentages for overhead and profit charged on Change Orders shall be negotiated and may vary according to the nature, extent, and complexity of the Work involved but in no case shall exceed the following:
 - 15% To the Contractor or the Subcontractor of any tier for Work performed with their respective forces or materials purchased
 - 5% To the Contractor on Work performed by other than his forces
 - 5% To first tier Subcontractor on Work performed by his Subcontractor
- .3** The Contractor will be allowed to add 2% for the cost of bonding and insurance to their cost of work. This 2% shall be allowed on the total cost of the added work, including overhead and profit.
- .4** Not more than three mark-ups, not to exceed individual maximums shown above, shall be allowed regardless of the number of tier subcontractors. Overhead and profit shall be shown separately for each subcontractor of any tier and the Contractor.
- .5** On proposals covering both increases and decreases in the amount of the Contract, the application of overhead and profit shall be on the net change in direct cost for the Contractor or Subcontractor of any tier performing the Work.
- .6** The percentages for overhead and profit credit to the Owner on Change Orders that are strictly decreases in the quantity of work or materials shall be negotiated and may vary according to the nature, extent, and complexity of the Work involved, but shall not be less than the following:

Overhead and Profit

 - 7.5% Credit to the Owner from the Contractor or Subcontractor of any tier for Work performed with their respective forces or materials purchased
 - 2.5% Credit to the Owner from the Contractor on Work performed by other than his forces
 - 2.5% Credit to the Owner from the first tier Subcontractor on Work performed by his Subcontractor of any tier

7.4 Extended General Conditions

7.4.1 The Contractor acknowledges that the percentage mark-up allowed on change orders for overhead and profit cover the Contractor's cost of administering and executing the Work, inclusive of change orders that increase the contract time. Contractor further acknowledges that no compensation beyond the specified mark-up percentages for extended overhead shall be due or payable as a result of an increase in the Contract Time.

7.4.2 The Owner may reimburse the Contractor for extended overhead if an extension of the Contract Time is granted by the Owner, in accordance with Article 4.7.1 and the Owner determines that the extension of the Contract Time creates an inequitable condition for the Contractor. If these conditions are determined by the Owner to exist, the Contractor may be reimbursed by unit prices contained in the Contractor's original bid and incorporated in the Construction Contract or by unit prices subsequently agreed upon.

7.4.3 If unit prices are subsequently agreed upon, the Contractor's compensation shall be limited as follows:

- .1** For the portion of the direct payroll cost of the Contractor's project manager expended in completing the Work and the direct payroll cost of other onsite administrative staff not included in Article 7.3.1. Direct payroll cost shall include base rate salaries and wages plus the cost of fringe benefits required by agreement or custom and social security contributions, unemployment, payroll taxes and workers' or workmen's compensation insurance and other customary and legally required taxes paid by the Contractor;
- .2** Cost of Contractor's temporary office, including temporary office utilities expense;
- .3** Cost of temporary utilities required in the performance of the work;
- .4** Profit not to exceed 5% of the total extended overhead direct costs;

7.4.4 All costs not falling into one of these categories and costs of the Contractors staff not employed onsite are not allowed.

7.5 Emergency Work

7.5.1 If, during the course of the Work, the Owner has need to engage the Contractor in emergency work, whether related to the Work or not, the Contractor shall immediately proceed with the emergency work as directed by the Owner under the applicable provisions of the contract. In so doing, Contractor agrees that all provisions of the contract remain in full force and effect and the schedule for the Work is not impacted in any way unless explicitly agreed to in writing by the Owner.

ARTICLE 8 TIME

8.1 Progress and Completion

8.1.1 Contractor acknowledges and agrees that time is of the essence of this Contract

8.1.2 Contract Time is the period of time set forth in the Contract for Construction required for Substantial Completion and Final Completion of the entire Work or portions of the Work as defined in the Contract Documents. Time limits stated in the Contract Documents are of the essence of the Contract. The Contract Time may only be changed by a Change Order. By executing the Contract, the Contractor confirms that the Contract Time is a sufficient period for performing the Work in its entirety.

8.1.3 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance and bonds required by Article 11 to be furnished by the Contractor.

8.1.4 The Contractor shall proceed expeditiously and diligently with adequate forces and shall achieve Substantial Completion and Final Completion within the time specified in the Contract Documents.

8.2 Delay in Completion

8.2.1 The Contractor shall be liable for all of the Owner's damages for delay in achieving Substantial Completion and/or Final Completion of the entire Work or portions of Work as set forth in the Contract Documents within the Contract Time unless liquidated damages are specifically provided for in the Contract Documents. If liquidated damages are specifically provided for in the Contract for Construction, Contractor shall be liable for such liquidated damages as set forth in Paragraph 8.3

8.2.2 All time limits stated in the Contract are of the essence of the Contract. However, if the Contractor is delayed at any time in the progress of the Work by any act or neglect of the Owner or by the Owner's Representative, by changes ordered in the Work, Force Majeure including but not limited to war, armed conflict, riot, civil commotion or disorder, act of terrorism or sabotage; epidemic, pandemic, outbreaks of infectious disease or any other public health crisis, including quarantine or other employee restrictions, compliance with any law or governmental order, rule, regulation or direction, curfew restriction, act of God or natural disaster such as earthquake, volcanic activity, landslide, tidal wave, tsunami, flood, damage or destruction by lightning, drought; explosion, fire, destruction of machines, equipment, prolonged break-down of transport, telecommunication or electric current; general labor disturbance such as but not limited to boycott, strike and lock-out, occupation of factories and premises, or any other causes beyond the Contractor's reasonable control which the Owner's Representative determines may justify

delay then, upon submission of the Time Impact Schedule Analysis (TIA) justifying the delay called out in Section 4.7 of these General Conditions, the Contract Time may be extended for a reasonable time to the extent such delay will prevent Contractor from achieving Substantial Completion and/or Final Completion within the Contract Time and if performance of the Work is not, was not or would not have been delayed by any other cause for which the Contractor is not entitled to an extension of the Contract Time under the Contract Documents. It shall be a condition precedent to any adjustment of the Contract Time that Contractor provide the Owner's Representative with written notice of the cause of delay within seven (7) days from the occurrence of the event or condition which caused the claimed delay. If a Force Majeure is approved by the Owner as the basis for a delay claim, an adjustment in the contract time to the extent the Force Majeure impacts the schedule is the only remedy. No increase in the contract sum for any reason shall be allowed due to a Force Majeure.

8.2.3 The Contractor further acknowledges and agrees that adjustments in the Contract Time will be permitted for a delay only to the extent such delay (1) is not caused, or could not have been anticipated, by the Contractor, (2) could not be limited or avoided by the Contractor's timely notice to the Owner of the delay, (3) prevents Contractor from completing its Work by the Contract Time, and (4) is of a duration not less than one (1) day. Delays attributable to and within the control of a Subcontractor or supplier shall not justify an extension of the Contract Time.

8.2.4 Notwithstanding anything to the contrary in the Contract Documents, except as otherwise noted in these General Conditions, an extension in the Contract Time, to the extent permitted under this Article, shall be the sole remedy of the Contractor for any (1) delay in the commencement, prosecution or completion of the Work, (2) hindrance or obstruction in the performance of the Work, (3) loss of productivity, or (4) other claims due to or caused by any events beyond the control of both the Owner and Contractor defined herein as Force Majeure. In no event shall the Contractor be entitled to any compensation or recovery of any damages or any portion of damages resulting from delays caused by or within the control of Contractor or by acts or omissions of Contractor or its Subcontractors of any tier or delays beyond the control of both Owner and Contractor. If the Contractor contends that delay, hindrance, obstruction or other adverse condition results from acts or omissions of the Owner, the Owner's Representative or the Architect, Contractor shall provide written notice to the Owner within seven (7) calendar days of the event giving rise to such claim. Contractor shall only be entitled to an adjustment in the Contract Sum to the extent that such acts or omissions continue after the Contractor's written notice to the Owner of such acts or omissions, but in no case shall Force Majeure be the basis of an increase in the Contract sum. The Owner's exercise of any of its rights or remedies under the Contract

Documents (including, without limitation, ordering changes in the Work, or directing suspension, rescheduling or correction of the Work) regardless of the extent or frequency of the Owner's exercise of such rights or remedies, shall not be the basis of any Claim for an increase in the Contract Sum or Contract Time. In the event Contractor is entitled to an adjustment in the Contract Sum for any delay, hindrance, obstruction or other adverse condition caused by the acts or omissions of the Owner, the Owner's Representative or the Architect, Contractor shall only be entitled to its actual direct costs caused thereby and Contractor shall not be entitled to and waives any right to special, indirect, or consequential damages including loss of profits, loss of savings or revenues, loss of anticipated profits, labor inefficiencies, idle equipment, home office overhead, and similar type of damages.

8.2.5 If the Contractor submits a progress report or any construction schedule indicating, or otherwise expressing an intention to achieve completion of the Work prior to any completion date required by the Contract Documents or expiration of the Contract Time, no liability of the Owner to the Contractor for any failure of the Contractor to so complete the Work shall be created or implied. Further, the Contractor acknowledges and agrees that even if Contractor intends or is able to complete the Work prior to the Contract Time, it shall assert no Claim and the Owner shall not be liable to Contractor for any failure of the Contractor, regardless of the cause of the failure, to complete the Work prior to the Contract Time.

8.3 Liquidated Damages

8.3.1 If Liquidated Damages are prescribed on the Bid Form and Special Conditions in the Contract Documents, the Owner may deduct from the Contract Sum and retain as Liquidated Damages, and not as penalty or forfeiture, the sum stipulated in the Contract Documents for each calendar day after the date specified for completion of the Work that the entire Work is not substantially complete and/or finally complete.

8.3.2 The Owner's Representative shall establish the date of Substantial completion and the date of Final Completion of the Work which shall be conclusive and binding on the Owner and Contractor for the purpose of determining whether or not Liquidated Damages shall be assessed under terms hereof and the sum total amount due.

8.3.3 Liquidated Damages or any matter related thereto shall not relieve the Contractor or his surety of any responsibility or obligation under this Contract.

ARTICLE 9 PAYMENTS AND COMPLETION

9.1 Commencement, Prosecution, and Completion

9.1.1 The Contractor shall commence Work within five (5) days upon the date of a "Notice to Proceed" from the Owner or the date fixed in the Notice to Proceed. Contractor shall prosecute the Work with faithfulness and diligence, and the

Contractor shall complete the Work within the Contract Time set forth in the Contract Documents.

9.1.2 The Owner will prepare and forward three (3) copies of the Contract and Performance Bond to the bidder to whom the contract for the Work is awarded and such bidder shall return two (2) properly executed prescribed copies of the Contract and Bond to the Owner.

9.1.3 The construction period, when specified in consecutive calendar days, shall begin when the Contractor receives notice requesting the instruments listed in below. Before the Owner will issue Notice to Proceed to permit the Contractor to begin Work, the Owner shall have received the following instruments, properly executed as described in the Contract Documents. The documents below shall have been received by the Owner within fifteen (15) days after receipt of request for documents:

- .1 Contract
- .2 Bond (See Article 11)
- .3 Insurance (See Article 11)
- .4 List of Subcontractors of any tier
- .5 Affirmative Action Plan (see Article 13.4)

9.1.4 In the event Contractor fails to provide Owner such documents, Contractor may not enter upon the site of the Work until such documents are provided. The date the Contractor is required to commence and complete the Work shall not be affected by the Owner denying Contractor access to the site as a result of Contractor's failure to provide such documents and Contractor shall not be entitled to an adjustment of the Contract Time or Contract sum as a result of its failure to comply with the provisions of this Paragraph

9.1.5 Contracts executed by partnerships shall be signed by all general partners of the partnership. Contracts signed by corporations shall be signed by the President or Vice President and the Secretary or Assistant Secretary. In case the Assistant Secretary or Vice President signs, it shall be so indicated by writing the word "Asst." or "Vice" in front of the words "Secretary" and "President". The corporate seal of the corporation shall be affixed. For all other types of entities, the Contractor and the person signing the Contract on behalf of Contractor represent and warrant that the person signing the Contract has the legal authority to bind Contractor to the Contract.

9.1.6 Any successful bidder which is a corporation organized in a state other than Missouri or any bidder doing business in the State of Missouri under a fictitious name shall furnish, at no cost to the Owner, no later than the time at which the executed Contract for Construction, the Payment Bond, and the Performance Bond are returned, a properly certified copy of its current Certificate of Authority and License to do business in the State of Missouri. No contract will be executed by the

Owner until such certificate is furnished by the bidder, unless there already is on file with the Owner a current certificate, in which event, no additional certificate will be required during the period of time for which such current certificate remains in effect.

9.1.7 Within fifteen (15) calendar days of the issuance of a Notice to Proceed, the Contractor shall submit one (1) signed copy of the following instruments. No payment will be processed until all of these instruments are received and approved by the Owner's Representative.

- .1 Reproducible progress and payment schedule
- .2 Contractor's Schedule of Values
- .3 List of material suppliers
- .4 Itemized breakdown of all labor rates for each classification. Overhead and profit shall not be included. Payroll cost shall include base rate salaries and wages plus the cost of fringe benefits required by agreement or custom and social security contributions, unemployment, payroll taxes and workers' or workmen's compensation insurance and other customary and legally required taxes paid by the Contractor or Subcontractors. Any item or expense outside of these categories is not allowed. The expense of performing Work after regular working hours, on Saturdays, Sundays or legal holidays shall not be included in the above, unless approved in writing and in advance by Owner.
- .5 Itemized breakdown of anticipated equipment rates (breakout operator rate). Overhead and profit shall not be included. Breakdown for required equipment shall itemize (at a minimum) delivery/ pick-up charge, hourly rate and hours used. Operator hours and rate shall not be included in the equipment breakdown. Contractor must use the most cost-effective equipment available in the area and should not exceed the rates listed in the Rental Rate Blue Book for Construction Equipment (Blue Book). Contractor shall submit documentation for the Blue Book to support the rate being requested.

9.1.8 The Contractor shall be paid electronically using the Owner's web-based payment program with a direct electronic transfer from the Owner's account into the Contractor's account. The Contractor must submit the following information to the Owner's Representative:

- .1 Bank Transit Number for the Contractor's bank into which the electronic deposit will be made.
- .2 Bank Account Number for the Contractor's account into which the electronic deposit will be made.
- .3 Contractor's E-Mail address so that formal notification of the deposit by the Owner can be provided.

9.2 Contract Sum

9.2.1 The Owner shall compensate Contractor for all Work described herein, and in the Contract Documents the Contract

Sum set forth in the Contract for Construction, subject to additions and deletions as provided hereunder.

9.3 Schedule of Values

9.3.1 Within fifteen (15) days after receipt of the Notice to Proceed, the Contractor shall submit to the Owner's Representative a schedule of values allocated to various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the Owner's Representative may require. This schedule, unless objected to by the Owner's Representative, shall be used as a basis for reviewing the Contractor's Applications for Payment. The values set forth in such schedule may, at the Owner's option be used in any manner as fixing a basis for additions to or deletions from the Contract Sum.

9.3.2 The progress and payment schedule of values shall show the following:

- .1** Enough detail as necessary to adequately evaluate the actual percent complete of any line item on a monthly basis, as determined by the Owner's Representative.
- .2** Line items, when being performed by a subcontractor or material supplier, shall correlate directly back to the subcontract or purchase order amount if requested by the Owner's Representative.

9.4 Applications for Payment

9.4.1 The Contractor shall submit monthly to the Owner's Representative and the Architect an itemized Application for Payment for operations completed in accordance with the Schedule of Values. Such application shall be supported by such data substantiating the Contractor's right to payment as the Owner's Representative or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and reflecting retainage as provided for herein.

9.4.2 Such applications shall not include requests for payment of amounts the Contractor does not intend to pay to a Subcontractor or material supplier

9.4.3 Progress payments shall be made on account of materials and equipment delivered to the site and incorporated in the Work. No payments will be made for materials and equipment stored at the Project site but not yet incorporated into the Work except as provided in Paragraph 9.4.4.

9.4.4 If approved in writing and in advance by Owner, progress payments may be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. Owner may in its sole discretion refuse to grant approval for payments for materials and equipment stored at the Project site but not yet incorporated in the Work. Any approval by Owner for payment for materials and equipment delivered and suitably stored at the site, or stored offsite as noted below,

for subsequent incorporation in the Work shall be conditioned upon Contractor's demonstrating that such materials and equipment are adequately protected from weather, damage, vandalism and theft and that such materials and equipment have been inventoried and stored in accordance with procedures established by or approved by the Owner. Nothing in this clause shall imply or create any liability on the part of the Owner for the Contractor's inventory and storage procedures or for any loss or damage to material, equipment or supplies stored on the site, whether incorporated into the work or not. In the event any such loss or damage occurs, the Contractor remains solely responsible for all costs associated with replacement of the affected materials, supplies and equipment including labor and incidental costs, and shall have no claim against the Owner for such loss.

No allowance shall be made in the project pay requests for materials not delivered to the site of the work and incorporated into the work, except as noted below. For the purposes of this Article, Offsite is defined as any location not owned or leased by the Owner. Contractor shall submit a list of materials that they are requesting payment for offsite storage within 60 days of Notice to Proceed.

- .1** Items considered to be major items of considerable magnitude, if suitably stored, may be allowed in project pay requests on the basis of ninety percent (90%) of invoices
- .2** Determination of acceptable "major items of considerable magnitude" and "suitably stored" shall be made by the Owner's Representative.
- .3** Aggregate quantities of materials not considered unique to this project will not be considered for offsite storage payment.
- .4** Contractor shall submit to the Owner's Representative a list of the material for which application for payment for offsite storage is anticipated no less than forty-five days prior to the submission of the applicable pay request. The list shall include a material description, applicable division, quantity, and discounts offered to the Owner for early payment. Contractor shall also submit the location the material will be stored and the method of protection
- .5** The storage facility shall be subject to approval by the Owner's representative, shall be located within an acceptable distance of the project sites as established by the Owner's Representative and all materials for the Owner's project must be stored separately from all other items within the storage facility and shall be labeled and stored in the name of The Curators of the University of Missouri.
- .6** The Owner's representative shall be provided a minimum of two weeks' notice to visit the storage facility and inspect the stored material prior to submission of the pay request.
- .7** Upon favorable inspection by the Owner's Representative, the Contractor shall, at the Owner's option, submit a Bill of Sale and Bailment Agreement on forms provided by the Owner's

Representative, transferring title of the material or equipment to The Curators of the University of Missouri.

- .8 An invoice provided by the supplier shall be included with the applicable pay request.
- .9 The contractor shall remain fully responsible for all items, until acceptance of the project by the Owner.
- .10 The contractor shall reimburse all costs incurred by the Owner in inspecting and verifying all material stored offsite, including mileage, airfare, meals, lodging and time, charged at a reasonable hourly rate.
- .11 The Contractor shall furnish and maintain insurance covering the replacement cost of the material stored offsite against all losses and shall furnish proof of coverage with the application for payment for material stored offsite.
- .12 The Contractor is responsible for all costs related to storage and handling of material stored offsite unless otherwise directed by the Owner's Representative.

9.4.5 The Application for Payment shall constitute a representation by the Contractor to the Owner that the Work has progressed to the point indicated; the quality of the Work covered by the Application for Payment is in accordance with the Contract Documents; and the Contractor is entitled to payment in the amount requested.

9.4.6 The Contractor will be reimbursed for ninety-five percent (95%) of the value of all labor furnished and material installed and computed in the same manner, less all previous payments made. On projects where a bond is not required, the contractor will be reimbursed for ninety percent (90%) of the value of all labor furnished and material installed and computed in the same manner, less all previous payments made

9.5 Approval for Payment

9.5.1 The Owner's Representative will, within fifteen (15) days after receipt of the Contractor's Application for Payment, either approve Contractor's Application for Payment for such amount as the Owner's Representative determines is properly due or notify the Contractor of the Owner's Representative's reasons for withholding certification in whole or in part as provided in Section 9.6.

9.6 Decisions to Withhold Approval

9.6.1 The Owner's Representative may decide not to certify payment and may withhold approval in whole or in part, to the extent reasonably necessary to protect the Owner. If the Owner's Representative is unable to approve payment in the amount of the Application, the Owner's Representative will notify the Contractor as provided in Paragraph 9.5.1. If the Contractor and Owner's Representative cannot agree on a revised amount, the

Owner's Representative will promptly issue approval for payment for the amount for which the Owner's Representative is able to determine is due Contractor. The Owner's Representative may also decide not to approve payment or, because of subsequently discovered evidence or subsequent observations, may nullify the whole or a part of approval for payment previously issued, to such extent as may be necessary in the Owner's Representative opinion to protect the Owner from loss because of:

- .1 defective or non-compliant Work not remedied, or damage to completed Work;
- .2 failure to supply sufficient skilled workers or suitable materials;
- .3 third party claims filed or reasonable evidence indicating probable filing of such claims;
- .4 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment, Owner may, at its sole option issue joint checks to subcontractors who have presented evidence that it has not been paid in accordance with the Contract;
- .5 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .6 damage to the Owner or another contractor;
- .7 reasonable evidence that the Work will not be completed within the Contract Time or an unsatisfactory rate of progress made by Contractor;
- .8 Contractor's failure to comply with applicable Laws;
- .9 Contractor's or Subcontractor's failure to comply with contract Prevailing Wage requirements; or
- .10 Contractor's failure to carry out the Work in strict accordance with the Contract Documents.

9.6.2 When the above reasons for withholding approval are removed, approval will be made for amounts previously withheld.

9.7 Progress Payments

9.7.1 Based upon Applications for Payment submitted to the Owner by the Contractor and approvals issued by the Owner's Representative, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

9.7.2 The period covered by each Application for Payment shall be one (1) calendar month.

9.7.3 The Owner shall make payment to Contractor for amounts due and approved by Owner's Representative not later than thirty (30) days after the Owner approves a properly detailed Application for Payment which is in compliance with the Contract Documents. The Owner shall not have the obligation to process or pay such Application for Payment until it receives an Application for Payment satisfying such requirements.

9.7.4 Based on the Schedule of Values submitted by Contractor, Applications for Payment submitted by Contractor

shall indicate the actual percentage of completion of each portion of Contractor's Work as of the end of the period covered by the Application for Payment.

9.7.5 The Contractor shall promptly pay each Subcontractor and Supplier, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's or supplier's portion of the Work, the amount to which said Subcontractor or supplier is entitled, reflecting percentages actually retained from payments to the Contractor on account of each Subcontractor's or supplier's portion of the Work, in full compliance with state statute. The Contractor shall, by appropriate agreement with each Subcontractor or supplier, require each Subcontractor or supplier to make payments to Sub-subcontractors in similar manner.

9.7.6 Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor of any tier nor a laborer or employee of Contractor except to the extent required by law. Retainage provided for by the Contract Documents are to be retained and held for the sole protection of Owner, and no other person, firm or corporation shall have any claim or right whatsoever thereto.

9.7.7 An approval for payment by Owner's Representative, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

9.8 Failure of Payment

9.8.1 If the Owner is entitled to reimbursement or payment from the Contractor under or pursuant to the Contract Documents, such payment by Contractor shall be made promptly upon demand by the Owner. Notwithstanding anything contained in the Contract Documents to the contrary, if the Contractor fails to promptly make any payment due the Owner, or the Owner incurs any costs and expenses to cure any default of the Contractor or to correct defective Work, the Owner shall have an absolute right to offset such amount against the Contract Sum and may, in the Owner's sole discretion, elect either to: (1) deduct an amount equal to that to which the Owner is entitled from any payment then or thereafter due the Contractor from the Owner, or (2) issue a written notice to the Contractor reducing the Contract Sum by an amount equal to that to which the Owner is entitled.

9.9 Substantial Completion

9.9.1 Substantial Completion is the stage in the progress of the Work as defined in Paragraph 1.1.14 as certified by the Owner.

9.9.2 When the Contractor considers the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall notify the Owner and the Architect. The Owner's

Representative will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Owner's Representative's inspection discloses any item which is not in accordance with the requirements of the Contract Documents, the Contractor shall complete or correct such item upon notification by the Owner's Representative. The Contractor shall then submit a request for another inspection by the Owner's Representative to determine Substantial Completion. When the Work or designated portion thereof is substantially complete, the Owner will issue a Certificate of Substantial Completion. Substantial Completion shall transfer from the Contractor to the Owner responsibilities for security, maintenance, heat, utilities, damage to the Work and insurance. In no event shall Contractor have more than thirty (30) days to complete all items on the Punch List and achieve Final Completion. Warranties required by the Contract Documents shall commence on the date of Substantial Completion or as agreed otherwise.

9.9.3 At the date of Substantial Completion, the Contractor may apply for, and if approved by Owner's Representative, the Owner, subject to the provisions herein, shall increase total payments to one hundred percent (100%) of the Contract Sum less one hundred fifty percent (150%) of the value of any incomplete Work and unsettled claims, as determined by the Owner's Representative.

9.10 Partial Occupancy or Use

9.10.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, security, maintenance, heat, utilities, damage to the Work and insurance. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by the Owner's Representative.

9.10.2 Immediately before such partial occupancy or use, the Owner, and Contractor shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work. Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

9.11 Final Completion and Final Payment

9.11.1 Upon receipt of written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Owner's Representative and the Architect will promptly make such inspection and, when the Owner's Representative and Architect find the Work acceptable under the Contract Documents and the Contract fully performed, the Owner's Representative will promptly issue a final approval for payment; otherwise, Owner's

Representative will return Contractor's Final Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application. Submission of a Final Application for Payment shall constitute a further representation that conditions listed in Paragraph 9.11.2 as precedent to the Contractor's being entitled to final payment have been fulfilled. All warranties and guarantees required under or pursuant to the Contract Documents shall be assembled and delivered by the Contractor to the Owner's Representative as part of the final Application for Payment. The final approval for payment will not be issued by the Owner's Representative until all warranties and guarantees have been received and accepted by the Owner.

9.11.2 The Owner will request the Contractor to submit the application for final payment along with a manually signed notarized letter on the Contractor's letterhead certifying that:

- .1** Labor costs, prevailing wage rates, fringe benefits and material costs have been paid.
- .2** Subcontractors of any tier and manufacturers furnishing materials and labor for the project have fully completed their Work and have been paid in full.
- .3** The project has been fully completed in accordance with the Contract Documents as modified by Change Orders.
- .4** The acceptance by Contractor of its Final Payment, by check or electronic transfer, shall be and operate as a release of all claims of Contractor against Owner for all things done or furnished or relating to the Work and for every act or alleged neglect of Owner arising out of the Work.

9.11.3 Final Payment constituting the entire unpaid balance due shall be paid by the Owner to the Contractor within thirty (30) days after Owner's receipt of Contractor's Final Application for Payment which satisfies all the requirements of the Contract Documents and Owner's receipt of all information and documents set forth in Section 9.11.

9.11.4 No payment under this Contract, including but not limited to final payment, shall constitute acceptance by Owner of any Work or act not in accordance with the requirements of the Contract Documents.

9.11.5 No recourse shall be had against any member of the Board of Curators, or officer thereof, for any payment under the Contract or any claim based thereon.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

10.1 Safety Precautions and Programs

10.1.1 The Contractor shall at all times conduct operations under this Contract in a manner to avoid the risk of bodily harm to persons or risk of damage to any property. The Contractor shall promptly take precautions which are necessary and adequate against conditions created during the progress of the Contractor's activities hereunder which involve a risk of bodily harm to persons or a risk of damage to property. The Contractor shall continuously inspect Work, materials, and equipment to discover and determine any such conditions and shall be solely responsible for discovery, determination, and correction of any such conditions. The Contractor shall comply with applicable safety laws, standards, codes, and regulations in the jurisdiction where the Work is being performed, specifically, but without limiting the generality of the foregoing, with rules regulations, and standards adopted pursuant to the Williams-Steiger Occupational Safety and Health Act of 1970 and applicable amendments.

10.1.2 All contractors, subcontractors and workers on this project are subject to the Construction Safety Training provisions 292.675 RSMo.

10.1.3 In the event the Contractor encounters on the site, material reasonably believed to be asbestos, polychlorinated biphenyl (PCB), lead, mercury, or other material known to be hazardous, which has not been rendered harmless, the Contractor shall immediately stop Work in the area affected and report the condition to the Owner's Representative and the Architect in writing. The Work in the affected area shall not thereafter be resumed except by written agreement of the Owner's Representative and Contractor if in fact the material is asbestos or polychlorinated biphenyl (PCB) and has not been rendered harmless. The Work in the affected area shall be resumed in the absence of asbestos or polychlorinated biphenyl (PCB), or when it has been rendered harmless by written agreement of the Owner's Representative and the Contractor. "Rendered Harmless" shall mean that levels of such materials are less than any applicable exposure standards, including but limited to OSHA regulations.

10.2 Safety Of Persons and Property

10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide protection to prevent damage, injury, or loss to:

- .1** students, faculty, staff, the public, construction personnel, and other persons who may be affected thereby;
- .2** the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor or the Contractor's Subcontractors of any tier; and
- .3** other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

10.2.2 The Contractor shall give notices and comply with applicable laws, standards, codes, ordinances, rules, regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury, or loss.

10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, safeguards for safety and protection, including, but not limited to, posting danger signs and other warnings against hazards, promulgating safety regulations, and notifying owners and users of adjacent sites and utilities.

10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise the highest degree of care and carry on such activities under supervision of properly qualified personnel.

10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Article 10 caused in whole or in part by the Contractor, a Subcontractor of any tier, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable, and for which the Contractor is responsible under Article 10, except damage or loss attributable solely to acts or omissions of Owner or the Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's other obligations stated elsewhere in the Contract.

10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents, and the maintaining, enforcing and supervising of safety precautions and programs. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner's Representative and Architect. The Contractor shall hold regularly scheduled safety meetings to instruct Contractor personnel on safety practices, accident avoidance and prevention, and the Project Safety Program. The Contractor shall furnish safety equipment and enforce the use of such equipment by its employees and its subcontractors of any tier.

10.2.7 The Contractor shall not load or permit any part of the construction or site to be loaded so as to endanger its safety.

10.2.8 The Contractor shall promptly report in writing to the Owner all accidents arising out of or in connection with

the Work which cause death, lost time injury, personal injury, or property damage, giving full details and statements of any witnesses. In addition, if death, serious personal injuries, or serious property damages are caused, the accident shall be reported immediately.

10.2.9 The Contractor shall promptly notify in writing to the Owner of any claims for injury or damage to personal property related to the work, either by or against the Contractor.

ARTICLE 11 INSURANCE & BONDS

11.1 Insurance

11.1.1 Contractor shall secure from the date of the Contract for Construction and maintain for such periods of time as set forth below, insurance of such types and in such amounts specified below, to protect Contractor, Owner and others against all hazards or risks of loss described below. The form of such insurance together with carriers thereof, in each case, shall be approved by Owner, but, regardless of such approval, it shall be the responsibility of Contractor to maintain the insurance coverages set forth herein.

11.1.2 The contractor shall not be allowed on the Owners property without proof of the insurance coverages set forth herein

11.2 Commercial General Liability

11.2.1 Contractor shall secure and maintain from the date of the Contract and for a period of at least five (5) years from the date of Final Completion of the entire Work Commercial General Liability insurance ("CGL") with a combined single limit of not less than \$2,000,000 per occurrence, \$5,000,000 general aggregate, \$5,000,000 products and completed operations aggregate and \$1,000,000 personal injury and advertising injury. General Aggregate should apply per project. An umbrella policy may be used to satisfy these limits. If the General Aggregate is not on a per project basis, the contractor shall provide an additional \$2,000,000 general aggregate.

11.2.2 CGL insurance shall be written on a comprehensive form and shall cover claims and liability in connection with or resulting from the Contractor's operations and activities under the Contract, for personal injuries, occupational sickness, disease, death or damage to property of others, including loss of use resulting therefrom, arising out of any operations or activities of the Contractor, its agents, or any Subcontractors of any tier or by anyone directly or indirectly employed by either of them.

11.2.3 CGL insurance shall include premises, operations, independent contractors, products-completed operations, personal injury and advertising injury and liability assumed under an insured contract (including the tort liability of another assumed in a business contract) coverages. In particular, and not by way of any limitation, the CGL

insurance shall cover the Contractor's indemnity obligations contained in the Contract Documents.

11.2.4 There shall be no endorsement or modification of the CGL policy limiting the scope of coverage for liability arising from blasting, explosion, collapse, or underground property damage.

11.2.5 "The officers, employees, and agents of The Curators of the University of Missouri" shall be endorsed as an "additional insured" under the CGL policy. The additional insured status must be conveyed by using the ISO CG 2 10 (2004) edition or equivalent and the ISO CG 20 37 (2004) edition. The policy shall be endorsed to be primary coverage and any other insurance carried by the Owner shall be excess only and will not contribute with Contractors' insurance. To confirm, the Endorsement should accompany the insurance certificate.

11.2.6 Contractor waives all rights against Owner and its agents, officers, representatives, and employees for recovery of damages to the extent those damages are covered by the CGL policy required hereunder.

11.3 Licensed for Use Vehicle Liability

11.3.1 Contractor shall secure and maintain from the date of the Contract for Construction until the date of Final Completion of the entire Work, insurance, to be on comprehensive form, which shall protect Contractor against any and all claims for all injuries and all damage to property arising from the use of automobiles, trucks and motorized vehicles, in connection with the performance of Work under this Contract, and shall cover the operation on or off the site of the Work of all motor vehicles licensed for highway use whether they are owned, non-owned or hired. Such insurance shall include contractual liability coverage and shall provide coverage on the basis of the date of any accident. The liability limits under such policy shall not be less than \$2,000,000 combined single limit for bodily injury and property damage per accident.

11.3.2 Contractor waives all rights against Owner and its agents, officers, directors, and employees for recovery of damages to the extent such damages are covered by the automobile liability insurance required hereunder.

11.4 Workers' Compensation Insurance

11.4.1 Contractor shall purchase and maintain workers' compensation insurance and employers' liability insurance which shall protect Contractor from claims for injury, sickness, disease or death of Contractor's employees or statutory employees. The insurance policies required hereunder shall include an "all states" or "other states" endorsement. In case any Work is sublet, Contractor shall require any Subcontractor of any tier to provide the insurance coverages required under this Section 11.4.

11.4.2 Contractor's workers' compensation insurance coverage shall be in compliance with all applicable Laws, including the statutes of the State of Missouri. Contractor's employers' liability coverage limits shall not be less than \$1,000,000 each accident for bodily injury by accident or \$1,000,000 each employee for bodily injury by disease.

11.5 Liability Insurance General/Other Requirements

11.5.1 Any Consultant/Contractor providing professional design services as part of the contract shall be required to provide and maintain, from the date of this Contract and for a period of ten (10) years after the date of Final Completion, Professional Liability insurance to cover any claims, including but not limited to errors, omissions, and negligence, which may arise from the Design and related Services performed by the Consultant. The minimum limits for such Policy shall be \$1,000,000.00 per occurrence/\$1,000,000.00 aggregate. The insurance afforded by the policy shall meet the requirements of this Section 11.2 and Section 11.5 relating to CGL Policies, and without limiting the foregoing, shall be extended to cover the liability of "The officers, employees, and agents of The Curators of the University of Missouri", who shall be named as additional insureds therein, and this liability is assumed in writing by the Contractor's Consultant under the written Subcontract described herein. All insurance coverages procured by Contractor shall be provided by agencies and insurance companies acceptable to and approved by Owner. Any insurance coverage shall be provided by insurance companies that are duly licensed to conduct business in the State of Missouri as an admitted carrier. The form and content of all insurance coverage provided by Contractor are subject to the approval of Owner. All required insurance coverages shall be obtained and paid for by Contractor. Any approval of the form, content or insurance company by Owner shall not relieve the Contractor from the obligation to provide the coverages required herein.

11.5.2 All insurance coverage procured by the Contractor shall be provided by insurance companies having policyholder ratings no lower than "A-" and financial ratings not lower than "XI" in the Best's Insurance Guide, latest edition in effect as of the date of the Contract, and subsequently in effect at the time of renewal of any policies required by the Contract Documents. Insurance coverages required hereunder shall not be subject to a deductible amount on a per-claim basis of more than \$10,000.00 and shall not be subject to a per-occurrence deductible of more than \$25,000.00. Insurance procured by Contractor covering the additional insureds shall be primary insurance and any insurance maintained by Owner shall be excess insurance.

11.5.3 All insurance required hereunder shall provide that the insurer's cost of providing the insureds a defense and appeal, including attorneys' fees, shall be supplementary and shall not be included as part of the policy limits but shall remain the insurer's separate responsibility. Contractor shall cause its insurance carriers to waive all rights of subrogation,

except for Workers' Compensation, against the Owner and its officers, employees and agents.

11.5.4 The Contractor shall furnish the Owner with certificates, Additional Insured endorsements, policies, or binders which indicate the Contractor and/or the Owner and other Contractors (where required) are covered by the required insurance showing type, amount, class of operations covered, effective dates and dates of expiration of policies prior to commencement of the work. Contractor is required to maintain coverages as stated and required to notify the University of a Carrier Change or cancellation within 2 business days. The University reserves the right to request a copy of the policy. Contractor fails to provide, procure, and deliver acceptable policies of insurance or satisfactory certificates or other evidence thereof, the Owner may obtain such insurance at the cost and expense of the Contractor without notice to the Contractor.

11.5.5 With respect to all insurance coverages required to remain in force and affect after final payment, Contractor shall provide Owner additional certificates, policies and binders evidencing continuation of such insurance coverages along with Contractor's application for final payment and shall provide certificates, policies and binders thereafter as requested by Owner.

11.5.6 The maintenance in full current force and effect of such forms and amounts of insurance and bonds required by the Contract Documents shall be a condition precedent to Contractor's exercise or enforcement of any rights under the Contract Documents.

11.5.7 Failure of Owner to demand certificates, policies and binders evidencing insurance coverages required by the Contract Documents, approval by Owner of such certificates, policies and binders or failure of Owner to identify a deficiency from evidence that is provided by Contractor shall not be construed as a waiver of Contractor's obligations to maintain the insurance required by the Contract Documents.

11.5.8 The Owner shall have the right to terminate the Contract if Contractor fails to maintain the insurance required by the Contract Documents.

11.5.9 If Contractor fails to maintain the insurance required by the Contract Document, Owner shall have the right, but not the obligation, to purchase said insurance at Contractor's expense. If Owner is damaged by Contractor's failure to maintain the insurance required by the Contract Documents, Contractor shall bear all reasonable costs properly attributable to such failure.

11.5.10 By requiring the insurance set forth herein and in the Contract Documents, Owner does not represent or warrant that coverage and limits will necessarily be adequate to protect Contractor, and such coverages and

limits shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

11.5.11 If Contractor's liability policies do not contain a standard separation of insureds provision, such policies shall be endorsed to provide cross-liability coverage.

11.5.12 If a part of the Work hereunder is to be subcontracted, the Contractor shall: (1) cover any and all Subcontractors in its insurance policies; (2) require each Subcontractor to secure insurance which will protect said Subcontractor and supplier against all applicable hazards or risks of loss designated in accordance with Article 11 hereunder; and (3) require each Subcontractor or supplier to assist in every manner possible in the reporting and investigation of any accident, and upon request, to cooperate with any insurance carrier in the handling of any claim by securing and giving evidence and obtaining the attendance of witnesses as required by any claim or suit.

11.5.13 It is understood and agreed that the insurance coverages required by the provisions of this Article 11 are required in the public interest and that the Owner does not assume any liability for acts of Contractor or Subcontractors of any tier or their employees in the performance of the Contract or Work.

11.6 Builder's Risk Insurance

11.6.1 The Contractor shall purchase and maintain, in a company or companies lawfully authorized to do business in the State of Missouri, as an admitted carrier, builder's risk insurance on the entire Work. Such insurance shall be written on a completed value form for the entire Work. The insurance shall apply on a replacement cost basis.

11.6.2 The insurance as required herein shall name as insureds the Owner, Contractor, and all Subcontractors of any tier. The insurance policy shall contain a provision that the insurance will not be canceled, allowed to expire or materially changed until at least thirty (30) days prior written notice has been given to Owner.

11.6.3 The insurance as required herein shall cover the entire Work, including reasonable compensation for Architect's services and expenses made necessary by an insured loss. Insured property shall include portions of the Work located away from the site (including all offsite stored materials) but intended for use at the site and shall also cover portions of the Work in transit, including ocean transit. The policy shall include as insured property scaffolding, falsework, and temporary buildings located at the site. The policy shall cover the cost of removing debris, including demolition as may be made legally necessary by the operation of any law, ordinance, or regulation.

11.6.4 The insurance required herein shall be on an all risk form and shall be written to cover all risks of physical loss or damage to the insured party and shall insure at least against the perils of fire and extended coverage, theft, vandalism,

malicious mischief, collapse, lightening, earthquake, flood, frost, water damage, windstorm and freezing.

11.6.5 If there are any deductibles applicable to the insurance required herein, Contractor shall pay any part of any loss not covered because of the operation of such deductibles.

11.6.6 The insurance as required herein shall be maintained in effect until the earliest of the following dates:

- .1 the date which all persons and organization who are insureds under the policy agree in writing that it shall be terminated;
- .2 the date on which final payment of this Contract has been made by Owner to Contractor; or
- .3 the date on which the insurable interests in the property of all insureds other than the Owner have ceased.

11.6.7 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors of any tier, suppliers, agents and employees, each of the other, (2) the Architect and Architect's consultants, and (3) separate contractors described in Article 6, if any, and any of their subcontractors of any tier, suppliers, agents and employees, for damages caused by fire or other perils to the extent covered by property insurance obtained pursuant to this Section 11.7 or other insurance applicable to the Work, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors of any tier, suppliers, agents, and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, was at fault or was negligent in causing the loss and whether or not the person or entity had an interest in the property damaged.

11.6.8 A loss insured under Contractor's property insurance shall be adjusted by the Owner in good faith and made payable to the Owner for the insureds, subject to requirements of the Contract Documents. The Contractor shall pay Subcontractors of any tier their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors of any tier to make payments to their Sub-subcontractors in similar manner.

11.7 Bonds

11.7.1 When the Contract sum exceeds Fifty Thousand Dollars (\$50,000), the Contractor shall procure and

furnish a Performance Bond and a Payment Bond in the form prepared by the Owner, each in an amount equal to one hundred percent (100%) of the Contract Sum, as well as adjustments to the Contract Sum. The Performance Bond shall secure and guarantee Contractor's faithful performance of this Contract, including but not limited to Contractor's obligation to correct defects after final payment has been made as required by the Contract Documents. The Payment Bond shall secure and guarantee payment of all persons performing labor on the Project under this Contract and furnishing materials in connection with this Contract. These Bonds shall be in effect through the duration of the Contract plus the Guaranty Period as required by the Contract Documents.

11.7.2 The bonds required hereunder shall be executed by a responsible surety licensed in the State of Missouri, with a Best's rating of no less than A-/XI. The Contractor shall require the attorney in fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of this power of attorney indicating the monetary limit of such power.

11.7.3 If the surety of any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to conduct business in the State of Missouri is terminated, or it ceases to meet the requirements of this paragraph, Contractor shall within ten (10) days substitute another bond and surety, both of which must be acceptable to Owner. If Contractor fails to make such substitution, Owner may procure such required bonds on behalf of Contractor at Contractor's expense.

11.7.4 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 to such person or entity.

11.7.5 The Contractor shall keep the surety informed of the progress of the Work, and, where necessary, obtain the surety's consent to or waiver of: (1) notice of changes in the Work; (2) request for reduction or release of retention; (3) request for final payment; and (4) any other material required by the surety. The Owner shall be notified by the Contractor, in writing, of all communications with the surety, as it relates to items one through four. The Owner may, in the Owner's sole discretion, inform surety of the progress of the Work, any defects in the Work, or any defaults of Contractor under the Contract Documents and obtain consents as necessary to protect the Owner's rights, interest, privileges and benefits under and pursuant to any bond issued in connection with the Work.

11.7.6 Contractor shall indemnify and hold harmless the Owner and any agents, employees, representative or member of the Board of Curators from and against any claims, expenses, losses, costs, including reasonable attorneys' fees, as a result of any failure of Contractor to procure the bonds required herein.

ARTICLE 12
UNCOVERING AND CORRECTION OF THE
WORK

12.1 Uncovering of the Work

12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it shall, if required in writing by the Architect or the Owner's Representative, be uncovered for the Architect's observation and be replaced at the Contractor's expense without change in the Contract Time.

12.1.2 If a portion of the Work has been covered which the Architect or the Owner's Representative has not specifically requested to observe, prior to its being covered, the Architect or the Owner's Representative may request to see such Work, and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be charged to the Owner. If such Work is not in accordance with the Contract Documents, the Contractor shall pay such costs unless the condition was caused by the Owner or a separate contractor in which event the Owner will be responsible for payment of such costs.

12.2 Correction of the Work

12.2.1 The Architect or Owner's Representative shall have the right to reject Work not in strict compliance with the requirements of the Contract Documents. The Contractor shall promptly correct Work rejected by the Architect or the Owner's Representative for failing to conform to the requirements of the Contract Documents, whether observed before or after final completion and whether or not fabricated, installed, or completed. If Work has been rejected by Architect or Owner's Representative, the Architect or Owner's Representative shall have the right to require the Contractor to remove it from the Project site and replace it with Work that strictly conforms to the requirements of the Contract Documents regardless, if such removal and replacement results in "economic waste." Contractor shall pay all claims, costs, losses and damages caused by or resulting from the correction, removal or replacement of defective, or non-compliant Work, including but not limited to, all costs of repair or replacement of Work of others. The Contractor shall bear costs of correcting, removing and replacing such rejected Work, including additional testing and inspections and compensation for the Architect's services and expenses made necessary thereby. If prior to the date of final payment, 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.

12.2.2 If, within twelve (12) months after the date of Final Completion of the Work or designated portion thereof, or after the date for commencement of warranties, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found not to be in strict accordance with the requirements of the Contract Documents, the Contractor shall correct or remove and replace such defective Work, at the Owner's discretion. Such twelve (12) month period is referred to as the "Guarantee Period." The obligations under this Paragraph 12.2.2 shall cover any repairs, removal, and replacement to any part of the Work or other property caused by the defective Work.

12.2.3 The Contractor shall remove from the site portions of the Work which are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

12.2.4 If the Contractor fails to correct nonconforming Work within a reasonable time, the Owner may correct or remove it and replace such nonconforming Work. If the Contractor does not proceed with correction of such nonconforming Work within a reasonable time fixed by written notice from the Owner, the Owner may take action to correct or remove the nonconforming work at the contractor's expense.

12.2.5 The Contractor shall bear the cost of correcting destroyed or damaged Work or property, whether completed or partially completed, of the Owner or of others caused by the Contractor's correction or removal of Work which is not in accordance with the requirements of the Contract Documents.

12.2.6 Nothing contained in Article 12 shall be construed to establish a period of limitation with respect to other obligations that the Contractor might have under the Contract Documents. Establishment of the twelve (12) month Guarantee Period as described in Article 12 relates only to the specific obligation of the Contractor to correct, remove or replace the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations under the Contract Documents. The requirements of Article 12 are in addition to and not in limitation of any of the other requirements of the Contract for warranties or conformance of the Work to the requirements of the Contract Documents.

12.3 Acceptance of Nonconforming Work

12.3.1 The Owner may accept Work which is not in accordance with the Contract Documents, instead of requiring its removal and correction, in its sole discretion. In Such case the Contract Sum will be adjusted as appropriate and equitable. Such adjustment shall be made whether or not final payment has been made. Nothing contained herein shall impose any obligation upon the Owner to accept nonconforming or defective Work.

ARTICLE 13 MISCELLANEOUS PROVISIONS

13.1 Written Notice

13.1.1 All notices required to be given by the contractor under the terms of this Contract shall be made in writing. Written notice when served by the Owner will be deemed to have been duly served if delivered in person to the individual or a member of the firm or entity or to an office of the corporation for which it was intended, or if delivered at or sent to the last business address known to the party giving notice.

13.2 Rights and Remedies

13.2.1 Duties and obligations imposed by the Contract Documents, and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

13.2.2 No action or failure to act by the Owner, the Architect, or the Owner's Representative will constitute a waiver of a right or duty afforded to the Owner under the Contract Documents, nor will such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing.

13.2.3 The terms of this Contract and all representations, indemnifications, warranties and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion and acceptance of the Work and termination or completion of the Work and shall remain in effect so long as the Owner is entitled to protection of its rights under applicable law.

13.2.4 Contractor shall carry out the Work and adhere to the current construction schedule during all disputes or disagreements with the Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements except as the Owner and Contractor may otherwise agree to in writing.

13.3 Tests and Inspections

13.3.1 Tests, inspections, and approvals of portions of the Work required by the Contract Documents or by laws, ordinances, rules, codes, or regulations shall be made at an appropriate time. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory, the Owner's Authorized Agent, or entity acceptable to the Owner, and the Contractor shall bear related costs of tests, inspections, and approvals as required in the Contract Documents. The Contractor shall give the Architect, Owner's Representative, and the Owner's Authorized Agent timely notice of when and where tests and inspections are to be made so the

Architect, the Owner's Representative and/or the Owner's Authorized Agent may observe procedures or perform the necessary tests or inspections.

13.3.2 If the Architect, Owner's Representative, or the Owner's Authorized Agent determine that portions of the Work require additional testing, inspection or approval not included in the Contract Documents, or required by law, the Architect, or the Owner's Representative will instruct the Contractor to make arrangements for such additional testing, inspection, or approval by an entity acceptable to the Owner's Representative and the Contractor shall give timely notice to the Architect, the Owner's Representative or the Owner's Authorized Agent, of when and where tests and inspections are to be made so the Architect, Owner's Representative and/or the Owner's Authorized Agent, ~~so~~ may choose that the tests or inspections can be performed or observed. The Owner will bear such costs except as provided elsewhere in Article 13.

13.3.3 If such procedures for testing, inspection, or approval under Article 13 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, the Contractor shall bear all costs made necessary by such failure including those of repeated procedures and compensation for the Architect's and Owner's Authorized Agent's services and expenses.

13.3.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor, and promptly delivered to the Owner's Representative and Architect.

13.3.5 Contractor shall take all necessary actions to ensure that all tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

13.3.6 Contractor shall arrange for and pay for all costs of all testing required by the Contract Documents or any applicable Laws for materials to be tested or certified at or on the place or premises of the source of the material to be supplied. The Owner shall have the right to require testing of all materials at the place of the source of the material to be supplied if not required by the Contract Documents or any applicable Laws. The Owner shall bear the costs of such tests and inspections not required by the Contract Documents or by applicable Laws unless prior defective Work provides Architect or Owner with a reasonable belief that additional defective Work may be found, in which case Contractor shall be responsible for all costs of tests and inspections ordered by the Owner or Architect, whether or not such tests or inspection reveals that Work is in compliance with the Contract Documents.

13.4 Nondiscrimination in Employment Equal Opportunity

13.4.1 The University serves from time to time as a contractor for the United States government. Accordingly, the provider of goods and/or services shall comply with

federal laws, rules and regulations applicable to subcontractors of government contracts including those relating to equal employment opportunity and affirmative action in the employment of minorities (Executive Order 11246), women (Executive Order 11375), persons with disabilities (29 USC 706) and Executive Order 11758, and certain veterans (38 USC 4212 formerly [2012]) contracting with business concerns with small disadvantaged business concerns (Publication L. 95-507). Contract clauses required by the Government in such circumstances are incorporated herein by reference.

13.5 Supplier Diversity Goal Program

13.5.1 The Contractor shall subcontract with diverse firms no less than the amount pledged in the Contractor's Bid and/or the amount accepted by the Owner.

13.5.2 If the Contractor must remove any diverse subcontractor of any tier, the Contractor shall replace the diverse subcontractor of any tier with another diverse subcontractor(s) of equal dollar value to the diverse supplier removed. The Contractor shall immediately notify the Owner's Representative in writing of the Contractor's intent to remove any, and the Contractor's plan to maintain subcontracts with diverse firms of no less than amount pledged in the Contractor's Bid and/or the amount accepted by the Owner. All changes of diverse subcontractor of any tier shall be approved by the Director of Facilities Planning & Development.

13.5.3 If the Contractor fails to meet or maintain the contractor's Supplier Diversity subcontracting pledge, the Contractor shall immediately notify in writing the Owner's Representative, and the Director of Facilities Planning & Development. Such notice shall include a description of the Contractor's good faith effort to comply with their Supplier Diversity subcontracting pledge.

13.5.4 If the Director of Facilities Planning & Development finds the Contractor has failed to comply in good faith with the Owner's Supplier Diversity goal program, the Director may take appropriate action, including but not limited to, declaring the Contractor ineligible to participate in any contracts with the Owner for a period not to exceed six (6) months, and/or directing that the Contractor's actions be declared a material breach of the Contract and that the Contract be terminated.

13.5.5 The Contractor and his subcontractors shall develop, implement, maintain, and submit in writing to the Director of Facilities Planning & Development, an affirmative action program if at least fifty (50) persons in the aggregate are employed under this contract. If less than fifty (50) persons in the aggregate are to be employed under this contract, the Contractor shall submit, in lieu of the written affirmative action program, a properly executed "Affidavit for Affirmative Action" in the form as included in the Contract Documents. For the purpose of this section, an "Affirmative Action Program"

means positive actions to influence all employment practices (including, but not limited to, recruiting, hiring, promoting, and training) in providing equal employment opportunity regardless of race, color, sex, national origin, religion, age (where the person affected is between 40 and 70), disabled and Vietnam-era veteran status, and handicapped otherwise qualified status. Such affirmative action program shall include:

- .1** A written policy statement committing the total organization to affirmative action and assigning management responsibilities and procedures for evaluation and dissemination.
- .2** The identification of a person designated to handle affirmative action.
- .3** The establishment of non-discriminatory selection standards, objective measures to analyze recruitment, an upward mobility system, a wage and salary structure, and standards applicable to lay-off, recall, discharge, demotion, and discipline.
- .4** The exclusion of discrimination from collective bargaining agreements.
- .5** Performance of an internal audit of the reporting system to monitor execution and to provide for future planning.

13.5.6 In the enforcement of this non-discrimination requirement, the Owner may use any reasonable procedures available, including but not limited to: requests, reports, site visits, and inspection of relevant documents of Contractors and Subcontractors of any tier. The contractor shall submit a final Affidavit of Supplier Diversity Participation for each diverse firm at the end of the project stating the actual amount paid to the diverse firm.

13.6 Wage Rates (If the contract amount is less than \$75,000, the requirements of this section will not apply. Any contract adjustments that increase the contract above \$75,000 will be subject to this section.)

13.6.1 The Contractor shall pay workers employed in the execution of this contract in full each week and not less than the predetermined wage rates and overtime for work of a similar character that have been made a part of this Contract. These rates are determined by the University of Missouri Director of Facilities Planning and Development. The rates are based on wage rates published in the Annual Wage Orders of the Missouri Department of Labor and Industrial Relations (MDLIR). The Contractor is to use MDLIR 8 CSR 30-3.020; .030; .040, .060 in determining the appropriate occupational titles and rates for workers used in the execution of this contract. All determinations and/or interpretations regarding wage rates and classification of workers will be made by the office of the University of Missouri Director of Facilities Planning and Development. The Contractor is responsible for the payment of the aggregate of the Basic Hourly Rate and the Total Fringe Benefits to the workers on the project. Fringe benefit payments may be made to the worker in cash, or irrevocably made by a Contractor or Subcontractor to a trustee or to a third person pursuant to a fund, plan or program, or pursuant to an enforceable

commitment, or any combination thereof, to carry out a financially responsible plan or program which was communicated in writing to the workmen affected, for medical or hospital care, pensions on retirement or death, compensation for injuries or illness resulting from occupational activity, or insurance to provide any of the foregoing, for unemployment benefits, life insurance, disability and sickness insurance, accident insurance, for vacation and holiday pay, for defraying costs of apprenticeship or other similar programs, or for other bona fide fringe benefits, but only where the Contractor or Subcontractor is not required by other federal or state law to provide any of the benefits as referenced in §290.210(5) RSMo 1994. Pay for travel, mileage, meals, bonuses, or other expenses are not fringe benefits and cannot be considered part of the workers wage rate. The Contractor shall not make any deductions for food, sleeping accommodations, transportation, use of small tools, uniforms, or anything of any kind or description, unless the Contractor and employee enter into an agreement in writing at the beginning of the worker's term of employment, and such agreement is approved by the Owner. In the event the contract contains more than one wage determination the Contractor shall comply with both.

13.6.2 The Contractor shall submit to the Owner with the Contractor's periodic pay request, certified payroll records for labor performed by the Contractor and Subcontractors of any tier. The Contractor shall submit all required certified payroll information records electronically in pdf format using the Owner's web-based payment program. The certified payroll forms shall contain the name, address, personal identification number, and occupational title of the workers as well as the hours they work each day. The Owner's acceptance of certified payroll records does not in any way relieve the Contractor of any responsibility for the payment of prevailing wages to workers on the project. The Contractor shall also maintain copies of the certified payroll records. The Owner may, at any time, request copies of, and/or inspect all of the Contractor's payroll records for the Work to verify compliance. The Contractor shall furnish the Owner copies of payroll records within 10 days of the Owner's written request. The Contractor shall provide copies of workers I-9 forms within 24 hours of written notice. (If applicable, and required by Owner, the Contractor will demonstrate that the Contractor is enrolled and participating in a federal work authorization program with respect to the employees working in connection with this project.) Such payroll records shall be maintained in accordance with Article 13.7.1 and shall be available for inspection for two (2) years after final completion of the Work. The contractor further agrees, in the event the records are not presented as requested, he will abide by any decision made by the Owner regarding underpayment of wages to workers and amounts owed them as well as liquidated damages for underpayment of wages. Falsification of the certified payroll records may

result in the debarment of the contractor or subcontractor from future work with the University.

13.6.3 The acquisition of products or services is subject to the supplier's conformance to the rules and regulations of the President's Committee on Equal Employment Opportunity (41 CFR, Ch. 60).

13.6.4 The Contractor shall comply with the Copeland Regulations of the Secretary of Labor (29 CFR, Part 3), which are incorporated herein by reference. In addition, the Weekly Statement of Compliance required by these Regulations shall also contain a statement that the applicable fringe benefits paid are equal to or greater than those set forth in the minimum wage decision.

13.6.5 Contractor acknowledges that violation of the requirements of Article 13.6 result in additional costs to Owner, including, but not limited to, cost of construction delays, of additional work for Owner's staff and legal expense. The cost of Contractor's violation of the provisions of Article 13.6 would be and is difficult to determine and establish. In the event that Contractor fails to comply with the provisions of this Article 13.6, Owner shall be entitled to retain or recover from the Contractor, as liquidated damages and not as a penalty, the sum of Fifty Dollars (\$50.00) per day per individual who is paid less than the applicable prevailing wage, to approximate the investigative cost resulting to the Owner for such violations. To approximate the delay costs, Owner shall be entitled to retain or recover from the Contractor, as liquidated damages and not as a penalty, the sum of One Hundred Dollars (\$100.00) per day for each day the Contract cannot be closed out and final payment made because of Contractor's failure to comply with the provisions of this Article 13.6. Such liquidated damages shall be collected regardless of whether the Work has been completed. The liquidated damages and other amounts set forth in this Article 13.6 shall be in addition to all other liquidated damages the Owner may be entitled as set forth in the Contract Documents.

13.6.6 The Owner may deduct liquidated damages described Article 13 and the amounts set forth in Article 13 from any unpaid amounts then or thereafter due the Contractor under the Contract. Any liquidated damages not so deducted from any unpaid amounts due the Contractor shall be payable to the Owner at the demand of the Owner.

13.6.7 The Contractor shall specifically incorporate the obligations of Article 13 into the subcontracts, supply agreements and purchase orders for the Work and require the same of any Subcontractors of any tier.

13.6.8 Contractor acknowledges and recognizes that a material factor in its selection by the Owner is the Contractor's willingness to undertake and comply with the requirements of this Article 13.6. If Contractor fails to comply with the provisions of this Article 13.6, Owner may, in its sole discretion, immediately terminate the Contract

upon written notice. The rights and remedies of Owner provided herein shall not be exclusive and are in addition to other rights and remedies provided by law or under this Contract.

13.6.9 Only such workers who are individually registered in a bona fide apprenticeship program approved by the U.S. Department of Labor, Office of Apprenticeship can be paid less than the journeyperson rate of pay. "Entry Level Workers; must be registered apprentices. The apprenticeship ratio will be one to one with a journeyperson of the same classification. Any worker not registered as an apprentice per this section will be paid as a journeyperson.

13.6.10 The Contractor shall post the wage rates for the contract in a conspicuous place at the field office on the project. On projects where there is no field office the Contractor may post the wage rates at their local office, as long as they provide a copy of the wage rates to a worker upon request. The wage rates shall be kept in a clearly legible condition for the duration of the project.

13.6.11 Neither the Contractor, nor any Subcontractor of any tier, nor any person hired by them or acting on their behalf, shall request or demand that workers pay back, return, donate, contribute, or give any part, or all, of said workers wages, salary, or any thing of value, upon the statement, representation or understanding that failure to comply with such request or demand will prevent such worker from procuring or retaining employment. The exception being to an agent or representative of a duly constituted labor organization acting in the collection of dues or assessments of such organization.

13.6.12 No contractor or subcontractor may directly or indirectly receive a wage subsidy, bid supplement, or rebate for employment on this project if such wage subsidy, bid supplement, or rebate has the effect of reducing the wage rate paid by the employer on a given occupational title below the prevailing wage rate as provided in contract. In the event a wage subsidy, bid supplement, or rebate is provided or received, the entity receiving such subsidy, supplement, or rebate shall report the date and amount of such subsidy, supplement, or rebate to the University within thirty days of receipt of payment. This disclosure report shall be a matter of public record. Any employer not in compliance with this Article shall owe to the University double the dollar amount per hour that the wage subsidy, bid supplement, or rebate has reduced the wage rate paid by the employer below the prevailing wage rate for each hour that work was performed.

13.6.13 Time and one-half overtime will be paid on all hours over 10 hours per day or 40 hours per week. The wage rate is the total of the "Basic Hourly Rate" plus "Total Fringe Benefits" or the "public works contracting minimum wage". For all work performed on a Sunday or

Holiday, not less than twice the prevailing hourly rate of pay or public works contracting minimum wage will apply. Holidays are as follows: January first, the last Monday in May, July fourth, the first Monday in September, November 11, the fourth Thursday in November, December twenty-fifth. If any holiday falls on a Sunday, the following Monday shall be considered a holiday.

13.7 Records

13.7.1 The Owner, or any parties it deems necessary, shall have access to and the right to examine any accounting or other records of the Contractor involving transactions and Work related to this Contract for five (5) years after final payment or five (5) years after the final resolution of any on going disputes at the time of final payment. All records shall be maintained in accordance with generally accepted accounting procedures, consistently applied. Subcontractors of any tier shall be required by Contractor to maintain records and to permit audits as required of Contractor herein.

13.8 Codes and Standards

13.8.1 The Work shall be performed to comply with the International Code Council (ICC) Codes, and the codes and standards noted below. The latest editions and supplements of these Codes and Standards in effect on the date of the execution of the Contract for Construction shall be applicable unless otherwise designated in the Contract Documents. Codes and standards required by accreditation agencies will also be used unless the ICC requirements are more stringent. In the event that special design features and/or construction systems are not covered in the ICC codes, the applicable edition of the National Fire Protection Association (NFPA) family of standards and/or the NFPA 101 Life Safety Code shall be used.

- .1** ICC International Building Code and reference standards
- .2** ICC International Plumbing Code
- .3** ICC International Mechanical Code
- .4** ICC International Fire Code
- .5** ICC International Fuel Gas Code
- .6** NFPA 70 National Electric Code (NEC)
- .7** Americans with Disabilities Act – Standards for Accessible Design.
- .8** American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks as published by the American Society of Mechanical Engineers (ASME), American National Standards Institute (ANSI) A17.1
- .9** NFPA 101 Life Safety Code (as noted above)
- .10** American Concrete Institute (ACI)
- .11** American National Standards Institute (ANSI)
- .12** American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
- .13** American Refrigeration Institute (ARI)
- .14** American Society for Testing and Materials (ASTM)
- .15** Missouri Standard Specification for Highway Construction, Missouri State Highway Commission

- .16 National Electrical Manufacturers Association (NEMA)
- .17 Underwriter's Laboratories, Inc. (UL), Federal Specifications
- .18 Williams Steiger Occupational Safety and Health Act of 1970 (OSHA)

13.9 General Provisions

13.9.1 Any specific requirement in this Contract that the responsibilities or obligations of the Contractor also apply to a Subcontractor is added for emphasis and are also hereby deemed to include a Subcontractor of any tier. The omission of a reference to a Subcontractor in connection with any of the Contractor's responsibilities or obligations shall not be construed to diminish, abrogate or limit any responsibilities or obligations of a Subcontractor of any tier under the Contract Documents or the applicable subcontract.

13.9.2 This Contract shall be interpreted, construed, enforced, and regulated under and by the laws of the State of Missouri. Whenever possible, each provision of this Contract shall be interpreted in a manner as to be effective and valid under applicable law. If, however, any provision of this Contract, or a portion thereof, is prohibited by law or found invalid under any law, only such provision or portion thereof shall be ineffective, without invalidating or affecting the remaining provisions of this Contract or valid portions of such provision, which are hereby deemed severable. Contractor and Owner further agree that in the event any provision of this Contract, or a portion thereof, is prohibited by law or found invalid under any law, this Contract shall be reformed to replace such prohibited or invalid provision or portion thereof with a valid and enforceable provision which comes as close as possible to expressing the intention of the prohibited or invalid provision.

13.9.3 Contractor and Owner each agree that the State of Missouri Circuit Court for the County where the Project is located shall have exclusive jurisdiction to resolve all Claims and any issue and disputes between Contractor and Owner. Contractor agrees that it shall not file any petition, complaint, lawsuit or legal proceeding against Owner in any other court other than the State of Missouri Circuit Court for the County where the Project is located.

13.9.4 Owner's total liability to Contractor and anyone claiming by, through, or under Contractor for any Claim, cost, loss, expense, or damage caused in part by the fault of Owner and in part by the fault of Contractor or any other entity or individual shall not exceed the percentage share that Owner's fault bears to the total fault of Owner, Contractor and all other entities and individuals as determined on the basis of comparative fault principles.

13.9.5 Contractor agrees that Owner shall not be liable to Contractor for any special, indirect, incidental, or consequential damage whatsoever, whether caused by

Owner's negligence, fault, errors or omissions, strict liability, breach of contract, breach of warranty or other cause or causes whatsoever. Such special, indirect, incidental or consequential damages include, but are not limited to loss of profits, loss of savings or revenue, loss of anticipated profits, labor inefficiencies, idle equipment, home office overhead, and similar types of damages.

13.9.6 Nothing contained in this Contract, or the Contract Documents shall create any contractual relationship with or cause of action in favor of a third party against the Owner.

13.9.7 No member or officer of the Board of Curators of the University incurs or assumes any individual or personal liability under the Contract or by reason of the default of the Owner in the performance of any terms thereof. Contractor releases and discharges all members or officers of the Board of Curators of the University from any liability as a condition of and as consideration for the award of the Contract to Contractor.

13.9.8 The Contractor hereby binds itself, its partners, successors, assigns and legal representatives to the Owner in respect to covenants, agreements and obligations contained in the Contract Documents. Contractor shall not assign the Contract or proceeds hereof without written consent of the Owner. If Contractor attempts to make such an assignment without such consent, it shall be void and confer no rights on third parties, and Contractor shall nevertheless remain legally responsible for all obligations under the Contract. The Owner's consent to any assignment is conditioned upon Contractor entering into a written assignment which contains the following language: "it is agreed that the funds to be paid to the assignee under this assignment are subject to performance by the Contractor and to claims and to liens for services rendered or materials supplied for the performance of the Work required in said Contract in favor of all persons, firms, corporations rendering such services or supplying such materials."

13.10 Certification

13.10.1 The contractor certifies to the best of its knowledge and belief that it and its principals are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency in accordance with Executive Order 12549 (2/18/86).

13.10.2 If this contract is for \$100,000 or more, and if the Contractor is a company with ten (10) or more employees, then Contractor certifies that it, and any company affiliated with it, does not boycott Israel, and will not boycott Israel during the term of this Contract. In this paragraph, the terms "company" and "boycott Israel" shall have the meanings described in Section 34.600 of the Missouri Revised Statutes.

ARTICLE 14
TERMINATION OR SUSPENSION OF THE
CONTRACT

14.1 Termination by Owner for Cause

14.1.1 In addition to other rights and remedies granted to Owner under the Contract Documents and by law, the Owner may terminate the Contract if the Contractor:

- .1** refuses or fails to supply enough properly skilled workers, superintendents, foremen, or managers;
- .2** refuses or fails to supply sufficient or proper materials;
- .3** fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- .4** disregards laws, ordinances, rules, codes, regulations or orders of an authority having jurisdiction;
- .5** disregards the authority of the Owner's Representative, Architect, or Owner's Authorized Agent;
- .6** breaches any warranty or representations made by the Contractor under or pursuant to the Contract Documents;
- .7** fails to furnish the Owner with assurances satisfactory to the Owner evidencing the Contractor's ability to complete the Work in compliance with all the requirements of the Contract Documents;
- .8** fails after commencement of the Work to proceed continuously with the construction and completion of the Work for more than ten (10) days, except as permitted under the Contract Documents;
- .9** fails to maintain a satisfactory rate of progress with the Work or fails to comply with approved progress schedules; or
- .10** violates in any substantial way any provisions of the Contract Documents.

14.1.2 When any of the above reasons exist, the Owner may, without prejudice to any other rights or remedies of the Owner, terminate this Contract by delivering a written notice of termination to Contractor and Contractor's surety, and may:

- .1** take possession of the site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2** accept assignment of subcontracts pursuant to Paragraph 5.3; and
- .3** finish the Work by whatever reasonable method the Owner may deem expedient, including turning the Work over to the surety.

14.1.3 The Contractor, in the event of a termination under Section 14.1, shall not be entitled to receive any further payments under the Contract until the Work is completed in its entirety. Then, if the unpaid balance

under the Contract shall exceed all expenses of the Owner in finishing the Work, including additional compensation for the Architects services and expenses made necessary thereby, such excess will be paid to the Contractor; but, if such expenses of Owner to finish the Work shall exceed the unpaid balance, the Contractor and its surety shall be liable for, and shall pay the difference and any damages to the Owner. The obligation of the Contractor and its surety for payment of said amounts shall survive termination of the Contract.

14.1.4 In exercising the Owner's right to secure completion of the Work under any of the provisions hereof, the Owner shall have the right to exercise the Owner's sole discretion as to the manner, methods, and reasonableness of costs of completing the Work.

14.1.5 The rights of the Owner to terminate pursuant to Article 14.1 will be cumulative and not exclusive and shall be in addition to any other remedy provided by law or the Contract Documents.

14.1.6 Should the Contractor fail to achieve Final Completion of the Work within thirty (30) calendar days following the date of Substantial Completion, the Owner may exercise its rights under Article 14.1.

14.2 Suspension by the Owner for Convenience

14.2.1 The Owner may, without cause, order the Contractor in writing to suspend, delay, or interrupt the Work in whole or in part for such period of time as the Owner may determine.

14.2.2 An adjustment will be made to the Contract Sum for increases in the cost of performance of the Contract caused by suspension, delay or interruption. However, in the event of a suspension under this Article 14.2, Contractor hereby waives and forfeits any claims for payment of any special, indirect, incidental or consequential damages such as lost profits, loss of savings or revenue, loss of anticipated profits, idle labor or equipment, home office overhead, and similar type damages. No adjustment will be made to the extent:

- .1** that performance is, was, or would have been so suspended, delayed or interrupted by another cause for which the Contractor in whole or in part is responsible, or
- .2** that an equitable adjustment is made or denied under another provision of this Contract.

14.3 Owner's Termination for Convenience

14.3.1 The Owner may, at any time, terminate the Contract in whole or in part for the Owner's convenience and without cause. Termination by the Owner under this Paragraph shall be by a notice of termination delivered to the Contractor specifying the extent of termination and the effective date.

14.3.2 Upon receipt of a notice of termination for convenience, the Contractor shall immediately, in accordance with instructions from the Owner, proceed with performance

of the following duties regardless of delay in determining or adjusting amounts due under this Paragraph:

- .1 cease operation as specified in the notice;
- .2 place no further orders and enter into no further subcontracts for materials, labor, services or facilities except as necessary to complete Work not terminated;
- .3 terminate all subcontracts and orders to the extent they relate to the Work terminated;
- .4 proceed to complete the performance of Work not terminated; and
- .5 take actions that may be necessary, or that the Owner may direct, for the protection and preservation of the terminated Work.

14.3.3 Upon such termination, the Contractor shall recover as its sole remedy payment for Work properly performed in connection with the terminated portion of the Work prior to the effective date of termination and for items properly and timely fabricated off the Project site, delivered and stored in accordance with the Owner's instructions and for all Owner approved claims, costs, losses and damages incurred in settlement of terminated contracts with Subcontractors and suppliers. The Contractor hereby waives and forfeits all other claims for payment and damages, including, without limitation, anticipated profits, consequential damages and other economic losses.

14.3.4 The Owner shall be credited for (1) payments previously made to the Contractor for the terminated portion of the Work, (2) claims which the Owner has against the Contractor under the Contract and (3) the value of the materials, supplies, equipment, or other items that are to be disposed of by the Contractor that are part of the Contract Sum.

14.3.5 Upon determination by a court that termination of Contractor or its successor in interest pursuant to Paragraph 14.1 was wrongful, such termination will be deemed converted to a termination for convenience pursuant to Paragraph 14.3, and Contractor's sole and exclusive remedy for wrongful termination is limited to recovery of the payments permitted for termination for convenience as set forth in Paragraph 14.3.

SECTION 1.E
SPECIAL CONDITIONS

1. DEFINITIONS

a. "Drawings"

Drawings referred to in and accompanying Project Manual consist of Drawings prepared by and bearing name of below defined Architect, bearing **October 27, 2023 – CP220951 Hill Hall – Building Envelope Repairs.**

b. Architect

PWArchitects, Inc.
2021 Forum Blvd., Ste. 101
Columbia, Mo. 65203
Phone: 573.449.2683

c. Electrical Engineer

J-Squared Engineering
2400 Bluff Creek Dr suite 101
Columbia, Mo. 65201
Phone: 573.234.4492

d. Structural Engineer

Crockett Engineering Consultants, LLC
1000 W Nifong Blvd, Bldg 1
Columbia, Mo. 65203
Phone: 573.447.0292

e. Other Definitions: See Article 1., General Conditions.

2. SPECIAL SCHEDULING REQUIREMENTS

a. Special scheduling requirements supplemental to the bid form.

(1) Normal working hours are defined as weekdays between the hours of 7:00am and 4:00pm, or as approved by Owner's Representative.

b. Contractor may not begin work in the designated areas until May 15, 2023.

c. All work at Work Area 1, East Elevation and Work Area 2, North Elevation must be complete by August 15, 2023 (*see sheet G101 for work area notes*).

d. The fall academic semester dates are as follows:

Classwork Begins on August 19, 2024 at 8:00 AM
Thanksgiving Recess begins on November 23 to December 2, 2024
Reading Day is scheduled for Friday, December 6, 2024
Final Exams are from December 9, 2024 to December 13, 2024
Commencement will be held on December 13, 14 & 15, 2024

3. SCOPE OF WORK

- a. The Contractor shall furnish all labor, materials, tools, equipment necessary for, and incidental to, construction of this project as indicated on Drawings and specified herein.
- b. Work shall include everything requisite and necessary to finish work properly, notwithstanding that every item of labor or materials or accessories required to make project complete may not be specifically mentioned.
- c. General Description of Work:
 - (1) Project consists of masonry restoration and repair, replacement of the east exterior entry stair, railing, and associated sidewalk, replacement of the existing windows, replacement of an entry door, and replacement of select exterior lighting – all on Hill Hall.
 - (a) Demolition work shall consist of removal of the existing east exterior concrete stair and railing systems, removal of designated areas of concrete paving, removal of designated areas of masonry, removal of the existing windows, trim, and associated window treatments, removal of the existing annex north entry, removal of select designated acoustic ceiling tile, and removal of an existing exterior lighting fixture at the annex.
 - (b) Architectural work shall consist of concrete paving, reconstruction of masonry wing walls at the east entry, masonry repointing, new brick masonry toothed into the existing, selective replacement of existing stone trim, consolidation of select existing stone to remain, stone patching, crack stitching, epoxy injection, replacement of existing designated lintels, installation of designated exterior railing systems, wood trim, pre-finished metal flashings, sealant repointing, select split slab waterproofing, aluminum windows, aluminum storefront, metal louvers, door hardware, replacement and/or reuse of designated acoustic ceiling tile systems, minor light-gauge framing, painting, staining, solid surface trim, and window treatments.
 - (c) Structural work shall consist of replacement of the existing east concrete entry stair.
 - (d) Electrical work shall consist of installation of select new exterior lighting, and controls for access control door hardware at the annex north entry.

4. LOCATION

Work shall be performed under this Contract on campus of the University of Missouri – Columbia at Hill Hall.

5. NUMBER OF CONSTRUCTION DOCUMENTS

- a. The Owner's Representative will furnish the Contractor a copy of executed Contract and a complete set of Drawings and Specifications in PDF format.

- b. The Owner will provide electronic data files to the Contractor for their convenience and use in progressing the Work and the preparation of shop drawings or other submittal requirements required for construction of the referenced project. The electronic data files shall reflect Construction Documents and Bid Addenda only. These files will be transmitted subject to the following terms and conditions:
- (1) The Owner makes no representation as to the compatibility of these files with the Contractor's hardware or software.
 - (2) Data contained on these electronic files shall not be used by the Contractor or anyone else for any purpose other than as a convenience in progressing the Work or in the preparation of shop drawings or other required submittals for the referenced project. Any other use or reuse by the Contractor or by others will be at their own sole risk and without liability or legal exposure to Owner. The Contractor agrees to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against the Owner and its consultants, contractors, agents, employees, and representatives that may arise out of or in connection with the use of the electronic files transmitted.
 - (3) Furthermore, the Contractor shall, to the fullest extent permitted by law, indemnify and hold harmless the Owner and its consultants, contractors, agents, employees, and representatives, against all damages, liabilities or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.
 - (4) These electronic files are not contract documents. Differences may exist between these electronic files and corresponding hard-copy construction documents. The Owner makes no representation regarding the accuracy or completeness of the electronic files you receive. In the event that a conflict arises between the signed or sealed hard-copy construction documents prepared by the Consultant and the electronic files, the signed and sealed hard-copy construction documents shall govern. The Contractor is responsible for determining if any conflict exists. By use of these electronic files, the Contractor is not relieved of their duty to fully comply with the contract documents.
 - (5) Because information presented on the electronic files can be modified, unintentionally or otherwise, the Owner reserves the right to remove all indications of ownership and/or involvement from each electronic display.
 - (6) Under no circumstances shall delivery of the electronic files be deemed a sale by the Owner and no warranties are made, either expressed or implied, of merchantability and fitness for any particular purpose. In no event shall the Owner be liable for any loss of profit, or any consequential damages as a result of use or reuse of these electronic files.

6. SUBMITTALS

- a. The Contractor shall submit for approval to the Architect, equipment lists and Shop Drawings, as expediently as possible. Failure of the Contractor to submit Shop Drawings in a timely manner will result in the Owner holding back Contractor payments. (See General Conditions)
- b. The material and equipment lists shall be submitted and approved before any material or equipment is purchased and shall be corrected to as-built conditions before the completion of the project.
- c. The Contractor shall submit electronic versions of all required Shop Drawings, material and equipment lists. The Contractor shall upload all Shop Drawings to a secure

information sharing website determined by the Owner notifying the Owner and Consultant that these shop drawings are available for review. Each submittal shall have the General Contractors digital stamp affixed to the first page signifying their review and acceptance. Review comments, approvals, and rejections will be posted on this same site with notification to the contractor. Submittals requiring a professional seal shall be submitted hard copy with a manual seal affixed.

- (1) The Contractor shall identify each submittal item with the following:
 - (a) Project Title and Location
 - (b) Project Number
 - (c) Supplier's Name
 - (d) Manufacturer's Name
 - (e) Contract Specification Section and Article Number
 - (f) Contract Drawing Number
 - (g) Acrobat file name: Spec Section_Times Submitted-Spec Title: 033000_01-Cast In Place Concrete.pdf
- (2) Reference the accompanying Shop Drawing and Submittal Log at the end of this section (1.E.2) for required submittal information.

- d. The Contractor shall submit to the Owner's Representative all items referenced in the accompanying Closeout Log (1.E.3) within 30 days following substantial completion of the work. The Owner's Representative will maintain the closeout log and include as an agenda item at all coordination meetings.

7. NOTIFICATION

Before beginning Demolition Work or service outages, the Contractor shall provide, at minimum, seventy-two (72) hours advance notice to Owner's Representative for purpose of verifying utility locations including, but not limited to, gas, telecommunications, electric, water, steam, sewer, and nitrogen. Contractor shall minimize the number of outages, minimize the length of outages and related work shall be continuous until the utility is restored.

8. USE OF PREMISES

- a. Access: Access to construction site shall be as indicated on Drawings and as directed by the Owner's Representative.
- b. Parking:
 - (1) The Owner will issue Contractor two (2) service vehicle parking permits for use in the Conley Avenue Parking Structure, located at 511 Conley Ave, Columbia, Mo. The permits will be issued at no cost to the contractor up to the contract completion date. After the contract completion date, the permits will be re-issued on an, as available basis at the contractors expense. These permits are to be used for general contractor or subcontractor owned and labeled vehicles only. Personal vehicles are prohibited from use of these permits. Violation of this requirement may result in ticketing and/or towing at the vehicle owner's expense and suspension of progress payments.
 - (2) Parking of personal vehicles within project access/lay down/staging areas is prohibited. Violation of this requirement may result in ticketing and/or towing at the vehicle owner's expense and suspension of progress payments.

- (3) Parking or driving on sidewalks, landscaped areas, within fire and service lanes or generally in areas not designated for vehicular traffic is prohibited except as allowed in the contract documents. Violation of this requirement may result in ticketing and/or towing at the vehicle owner's expense and suspension of progress payments.
 - (4) Sidewalk(s) and Hardscape – Parking/driving on hardscapes is strictly prohibited unless specifically directed by the Owner's Representative through the MU sidewalk permitting process. Restricted use permits will be limited to activities that are constrained by an absolute need to access from a sidewalk. Such activities shall be considered the exception and not the norm. Adequate signage, fencing and alternate routes must be provided in the immediate and adjacent areas
 - (5) Free parking for contractor employees is available in the Ashland Road Contractor lot on an as available basis. This space is for use by contractor employees for parking their personal vehicles only and is not to be used for staging or storage.
 - (6) Vendor Permits may be purchased by contractor management personnel on an as available basis by contacting the Parking and Transportation office in the General Services Building. These permits will allow contractor management personnel to park in various University lots while conducting business on University construction projects.
 - (7) Temporary University parking permits may be purchased by contractor employees for use with their personal vehicles on an as available basis by contacting the Parking and Transportation office in the General Services Building.
 - (8) Conley Avenue between Missouri Avenue and University Avenue and Hitt Street between University Avenue and the Memorial Union are designated for pedestrian use only during the work week between the hours of 8:15 AM and 3:45 PM. Unless otherwise indicated in the contract documents, this area is strictly off limits to vehicular traffic without authorization from the Owner's Representative.
- c. Storage of materials: The Contractor shall store all materials within project limits. The Contractor shall confine apparatus, materials, and operation of workers to location established by the Owner's Representative. The Contractor shall not unreasonably encumber premises with materials. In addition, storage trailer locations may be available within 1-1/2 miles of project site as directed by the Owner's Representative. Storage trailer locations shall be subject to approval by the Owner's Representative and are available to the Contractor without cost.
- d. Utilities: Drinking water, water required to carry on work, and 120-volt electrical power required for small tool operation may be obtained without cost to the Contractor from existing utilities at locations designated by the Owner's Representative. Provisions for obtaining power, including temporary extensions, shall be furnished, and maintained by the Contractor. Upon completion of work such extensions shall be removed and any damage caused by use of such extensions shall be repaired to satisfaction of the Owner's Representative, at no cost to the Owner.

- e. Restroom: The Contractor shall provide and maintain, in a sanitary condition, chemical type portable toilet facilities at work site for use by his personnel. Toilets and toilet location shall be subject to approval by the Owner's Representative.
- f. Smoking is prohibited at the University of Missouri and all properties owned, operated, leased or controlled by the University of Missouri. Violation of the policy is defined as smoking any tobacco products, including e-cigarettes.
- g. Landfill: The Contractor shall not use the Owner's landfill. Dumping or disposal of excavated or demolition materials on Owner's property shall not be permitted. The Contractor shall remove and legally dispose of excavated or demolished materials off the Owner's property.
- h. Care of Project Work Site: The contractor shall be responsible for maintaining the construction site in a reasonably neat and orderly condition by regular cleaning and mowing of the premises as determined by the Owner's Representative.
- i. Discharge to Sewer Request: The University of Missouri's MS4 permit and NPDES Storm Water Discharge Permits along with the City of Columbia's POTW Operating Permit as well as local ordinances, and state and federal environmental regulations prohibit hazardous materials from being disposed into either the storm water or sanitary sewer systems. Unless specifically approved, all chemical products such as paints, dyes, lawn care products, maintenance products, and oil are prohibited from drain disposal. Any product, including contaminated water, being discarded into the storm water or sanitary sewer systems requires written approval from the Owner through a formal "Discharge to Sewer Request" form obtained at [Discharge to Sewer Request Form](#). The contractor should submit the form to the Owner's Representative, not to the Department of Environmental Health and Safety as the form indicates.
- j. All concrete waste material including washout water shall be totally contained and removed from the Owner's property.
- k. Artifacts Found During Construction: Contractor shall immediately notify the Owner's Representative when artifacts are uncovered or found during the demolition or construction process. Artifacts include, but are not limited to, tools, drawings (construction or other), photographs, books and other objects/devices which may hold historical importance/significance. Do not remove or disturb the object(s) in question. Artifacts are not considered part of demolished materials and shall remain the property of the University of Missouri.
- l. **"Permit Required Confined Space" Entry Communication and Coordination**
(See OSHA 1926 subpart aa – Construction Confined Space for the definition of "permit required confined spaces" - Note: OSHA does not apply to the University. However, the University will provide a list of all known "permit required confined spaces")

There are no known "permit required confined spaces" within the project limits. Each contractor shall conduct a survey to confirm whether or not any confined spaces exist within the project limits. It is incumbent upon each contractor to list all "permit required spaces".

The Contractor shall notify the Owner's Representative if 1) conditions change resulting in a non-permit required confined space being reclassified to a "permit required confined space" after evaluation of the space by a competent person; 2) a space previously thought

to be non-permit required space is classified as a “permit required confined space”; or 3) during the course of construction a “permit required confined space” is created after evaluation by a competent person.

The Contractor shall submit to the Owner’s Representative a copy of the cancelled confined space entry permit and a written report summarizing the permit space program followed and all hazards confronted or created during entry operations. This information shall be submitted within one week of cancelling the permit.

9. PROTECTION OF OWNER'S PROPERTY

- a. The Contractor shall be responsible for repair of damage to building exterior and interior, drives, curbs, streets, walks, grass, shrubbery and trees, which was caused by workmen or equipment employed during progress of work. All such repairs shall be made to satisfaction of the Owner's Representative, at no cost to the Owner, or reimburse the Owner if the Owner elects to make repairs. For landscape damage, the Owner shall make such repairs. Compensation for these repairs shall be determined by the Owner's Representative using the "Valuation of Landscape Trees, Shrubs, and other Plants" as published by the International Society of Arboriculture, as last revised.
- b. Construction Project Fencing:
 - (1) Fencing requirements, as indicated on Drawings, shall be constructed of 9 or 11-gauge chain link fence panels not less than six (6) feet in height and not more than 2-inch mesh with posts spaced not more than ten (10) feet apart and mounted on “tee”-stands sufficiently weighted to keep the fence in position. Fenced in area shall have at least two (2) access gates and all gates shall be lockable.
 - (2) Fence screening fabric shall be used on all perimeter fencing. Fabric shall be green in color, full height of the project fence, securely attached and properly maintained throughout the duration of the project.
 - (3) Using existing landmarks, lamp posts, trees, or other Owner property for support of fencing is strictly prohibited unless a written waiver is obtained from Owner's Representative.
 - (4) Use of ribbon, snow fence, chicken wire, rope, and wooden barricades as fencing is prohibited.
 - (5) Fencing shall be maintained in an "as-installed" condition throughout the life of the project.
 - (6) The Contractor may use used fencing provided it is in good condition and is satisfactory to the Owner's Representative.
- c. Preserving and Protecting Existing Vegetation:
 - (1) Protection and compensation for damages:
 - (a) Trees and shrubs within work area designated to remain shall be protected from damage during construction by fixed chain link fencing or armoring as indicated on Drawings or specified herein. Plant protection devices shall be installed before work has begun and shall be maintained for duration of work unless otherwise directed by Owner's Representative.

- (2) Plants within work area designated for removal shall be removed by Contractor.
- (3) To prevent compaction of soil over tree roots, vehicles or equipment shall not at any time park or travel over, nor shall any materials be stored within drip line of trees designated to remain.
- (4) Owner's Representative will stop work immediately when proper measures are not being employed to protect trees and shrubs. Contractor will be notified to resume work after required protection measures are implemented.
- (5) Pruning of limbs necessary to repair damage or provide clearance for work shall be done by the MU Landscape Services Department at the direction of the Owner's Representative. Limbs shall be cut off cleanly and cut surfaces treated according to established horticultural standards.

10. SUBSTITUTIONS and EQUALS

- a. Substitutions are defined in General Conditions article 3.11.8 for and Equals are defined General Conditions Article 3.12 .
- b. Use of materials, products, or equipment other than those named and described in the Contract Documents are substitutions and/or equal. Substitutions and/or equals submitted during the bidding period shall be received by both the Architect and the Owner at least ten calendar days prior to the date for receipt of bids. To be considered, bidder's proposal shall include a complete description of the proposed substitution and/or equal and a comparison of significant qualities of the proposed substitution and/or equal with those specified including drawings, performance and test data, and other information necessary for an evaluation. The Architect's decision on the approval or disapproval of a proposed substitution and/or equal shall be final.
- c. If the Architect and Owner approve a proposed substitution prior to receipt of Bids, such approval will be set forth in an Addendum. Bidders shall not rely upon approval made in any other manner.

11. CODES AND STANDARDS

The Contractor shall comply with applicable codes and standards as listed in General Conditions.

12. PERMITS

- a. Permits and inspection for work on UM property are required.
- b. The Owner's Representative shall secure University Authority Having Jurisdiction building permits required for the project and shall provide a list of required inspections to the Contractor.
 - (1) The Contractor shall coordinate and provide reasonable scheduling and access to the Work for the Owner's Inspection.
 - (2) Re-inspection of work as a result of either failed inspection or work not ready as scheduled may be at the Contractor's expense.
- c. The Contractor shall comply with applicable codes and standards as listed in the Contract Documents and General Conditions.
- d. All permits, including but not limited to Hot Work, Fire Alarm, Energized Work and

HVAC interruption shall be coordinated and scheduled with the Owner's Representative or designee prior to commencement of the work.

13. SPECIALTIES

- a. Owner furnished topsoil: The contractor shall place Owner provided topsoil and grade to the finish elevation as defined in the contract. The contractor will load and haul topsoil from the Owner's stockpile located within two (2) miles of the project site. The contractor is required to notify the Owner a minimum of five working days in advance of the needed topsoil. Topsoil shall be placed with rubber tracked equipment to minimize compaction. Placement shall be sequenced to minimize compaction and damage to the topsoil. Topsoil or subsoil damaged, contaminated, or compacted during topsoil placement shall be repaired or replaced as directed by the Owner's Representative. Hand work shall be required next to adjacent structures and around utilities. Erosion control measures shall be maintained throughout and after topsoil placement.

- (1) The sub-grade is to be left at minus six inches (6") in all areas unless indicated otherwise. All planting bed sub-grades are to be left a minus eighteen inches (18"). The contractor is to remove all deleterious material from the sub-grade prior to placing topsoil. All subgrade areas shall contain at least 6" of subsoil, (ie. cover clean rock backfilled areas). All subgrade areas shall be "ripped" a minimum of 6" deep and a maximum of 12" apart in opposite directions with minimal tire traffic to follow. All exposed deleterious material and unacceptable rock shall be removed.
- (2) The contractor shall adjust all yard boxes valve boxes, pull boxes, cleanouts, and manhole lid rings etc. (includes irrigation, sewers, water and electric), to the indicated finish grade.
- (3) Final plantings will be by the Owner. The Owner will water and maintain all seed, sod and landscaping.

14. PRE-BID INSPECTION

All pre-bid inspections of work areas shall be scheduled with pre-bid inspection guide, telephone: (573) 882-2228.

15. MODIFICATIONS TO INFORMATION TO BIDDERS

- a. Information to Bidders:

- (1) Referenced Information to Bidders, Page IFB/5.
Add new Article 15.8.5 as follows:

15.8.5 Within 48 hours of the receipt of bids, the apparent low bidder shall submit to the Director of Facilities Planning and Development an "Affidavit of Supplier Diversity Participation" for every diverse subcontractor or supplier the bidder intends to award work to on the contract. The affidavit will be signed by both the bidder and the diverse firm.

16. MODIFICATIONS TO GENERAL CONDITIONS

a. General Conditions:

- (1) Add to the Insurance Requirements in General Conditions Article 11, Asbestos Liability Coverage, for specified asbestos abatement in the contract documents, in a limit no less than \$1,000,000 combined single limit, per occurrence and aggregate, for both bodily injury and property damage combined. The Owner will accept coverage from the Asbestos Removal Subcontractor in lieu of the General Contractor subject to all requirements set forth in article 11.

17. PROJECT SCHEDULING

The project scheduling specification for the project are included immediately after the Special Conditions. For this project the Contractor shall meet the following scheduling requirements.

Contractor is responsible for the schedule and must comply with the Owner's requirements. See Contractor Schedule Specification included in these documents.

18. PROJECT COORDINATION

- a. Coordinate construction operations included in various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections that depend on each other for proper installation, connection, and operation.
- (1) Schedule construction operations in the sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - (2) Coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.
 - (3) Make provisions to accommodate items scheduled for later installation.

19. SAFETY PRECAUTIONS AND PROGRAMS

- a. The contractor shall provide Emergency Contact Information for the Contractor's on-site staff and home office management as well as contact information for all major subcontractor personnel. This information shall contain business and personal phone numbers for each individual for contact during or after hours in case of an emergency. This information shall be submitted within 15 days of the Notice to Proceed.

20. HOT WORK PERMITTING AND GENERAL REQUIREMENTS

Hot work Requirements: The contractor shall comply with the following hot work requirements and the requirements of the International Fire Code and 2014 NFPA 51B.

- a. Hot work shall be defined as any work involving burning, welding, grinding, cutting, or similar operations that are capable of initiating fires or explosions.
- b. The Contractor shall utilize the hot work permit decision tree and permit provided in the 2014 NFPA 51B for all Hot Work operations.
- c. A hot work permit shall be used on all hot work performed outside a designated hot work area. The hot work permit shall be posted and clearly visible within proximity of the hot work area. The hot work permit authorizing individual (PAI) shall be as designated by the Contractor.

- d. Notify the Owner's Representative 24 hours prior to starting hot work in buildings with operational fire alarm or fire suppression systems. The Owner's Representative will coordinate the appropriate system outage with Campus Maintenance personnel.
- e. Unless otherwise instructed by the Owner's Representative, the Contractor shall post a copy of each completed hot work permit to the Owner's project management file system the following business day.

21. GENERAL REQUIREMENTS FOR CRANE AND HOISTING OPERATIONS

All crane and hoisting operations shall be performed in compliance with OSHA 29 CFR 1926. All Operators, riggers, and signal persons must have the proper qualifications and training necessary to perform the intended hoisting activities for this project.

- a. Only fully certified and evaluated Operators shall perform equipment operations. Operators in an "Operator in Training" status shall not be used.
- b. Submittal requirements:
 - 1. Submit copies of Operator certifications, licenses, and evaluations to the Owners Representative.
 - 2. Submit Rigger and Signal Person qualifications to the Owners Representative.
 - 3. Unless otherwise directed by the Owners Representative, submit a lift plan, and conduct a lift coordination meeting for hoisting or crane operations for any lift greater than 2,000 pounds, or for any multi pick lift. Include protective measures for existing underground utilities, occupied buildings, pedestrian and vehicle pathways, adjacent buildings, and overhead power lines. If the lift is to occur over an occupied building, provide a registered structural engineer's review and verification that the building can resist the impact of a dropped load for the intended lift. If evacuation of an occupied building is necessary to conduct the lift, the decision for building evacuation or scheduling the lift for off-hours will be determined by the Owner.

22. CONSTRUCTION WASTE MANAGEMENT

The goal of Construction Waste Management is to divert waste from the sanitary landfill. This shall be accomplished through reuse, recycling and/or salvage of non-hazardous construction and demolition debris to the greatest extent practical. Track and report all efforts related to reuse, recycling and/or salvage materials from the project (including clean fill material). Report all material types and weights, where material was diverted, type of diversion, documentation of diversion (eg: waste or recycling tickets), and applicable dates. In order to calculate the diversion percentage, total weights of all non-hazardous landfill material must be reported. This information shall be updated monthly utilizing the [Construction Waste Management Worksheet](http://www.cf.missouri.edu/cf/pdc/contractor_information) provided here: [for MU] http://www.cf.missouri.edu/cf/pdc/contractor_information. Copies of all applicable receipts, tickets and tracking logs shall be uploaded to the Owner's information sharing website or reported as required by the Construction Project Manager.

23. WARRANTY WALKTHROUGH

Contractor shall attend a walk-thru with the Owner at 11 months after acceptance to review and document any warranty items to be addressed as part of the 12-month warranty stated in article 3.1 of the General Conditions.

END OF SECTION

Contractor Schedule

1. GENERAL

a) Time is of the essence for this contract.

The time frames spelled out in this contract are essential to the success of this project. The University understands that effective schedule management, in accordance with the General Conditions and these Special Conditions is necessary to insure to that the critical milestone and end dates spelled out in the contract are achieved.

b) Related Documents

Drawings and general provisions of the Contract, including General Conditions' Article 3.17 shall apply to this Section.

c) Stakeholders

A Stakeholder is anyone with a stake in the outcome of the Project, including the University, the University Department utilizing the facility, the Design Professionals, the Contractor and subcontractors.

d) Weather

- (1) Contractor acknowledges that there will be days in which work cannot be completed due to the weather, and that a certain number of these lost days are to be expected under normal weather conditions in Missouri.
- (2) Rather than speculate as to what comprises "normal" weather at the location of the project, Contractor agrees that it will assume a total of 44 lost days due to weather over the course of a calendar year and include same in its as planned schedule. For projects of less than a calendar year, lost weather days should be prorated for the months of construction in accordance with the following schedule.
- (3) Anticipated weather days for allocation/proration only. For projects lasting 12 months or longer, the 44 days per year plus whatever additional months are included will constitute normal weather.

Jan – 5 days	Feb – 5 days	Mar – 4 days	Apr – 4 days
May – 3 days	Jun – 3 days	Jul – 2 days	Aug – 2 days
Sep – 3 days	Oct – 4 days	Nov – 4 days	Dec – 5 days

2. SCHEDULING PROCESS

- #### a) The intent of this section is to ensure that a well-conceived plan, that addresses the milestone and completion dates spelled out in these documents, is developed with input from all stakeholders in the project. Input is limited to all reasonable requests that are consistent with the requirements of the contract documents, and do not prejudice the Contractor's ability to perform its work consistent with the contract documents.

Further, the plan must be documented in an understandable format that allows for each stakeholder in the project to understand the plan for the construction and/or renovation contained in the Project.

b) Contractor Requirements

(1) Schedule Development

Contractor shall prepare the Project Schedule using Primavera SureTrack or P3, Microsoft Project, Oracle P6, or other standard industry scheduling software, approved by the Owner's Representative.

(2) Schedule Development

Within 2 weeks of the NTP, contractor shall prepare a schedule, preferably in CPM

format, but in detailed bar chart format at a minimum, that reflects the contractor's and each subcontractor's plan for performing the contract work.

Contractor shall review each major subcontractor's schedule with the sub and obtain the subcontractor's concurrence with the schedule, prior to submitting to the University.

(3) Schedule Updates.

- (a) Schedule Updates will be conducted once a month, at a minimum.

Actual Start and Finish dates should be recorded regularly during the month. Percent Complete, or Remaining Duration shall be updated as of the data date, just prior to Contractor's submittal of the update data.

- (b) Contractor will copy the previous months schedule and will input update information into the new monthly update version.

- (c) Contractor will meet with the Owner's Representative to review the draft of the updated schedule. At this meeting, Owner's Representative and Contractor will:

- (i) Review out of sequence progress, making adjustments as necessary,
- (ii) Add any fragments necessary to describe changes or other impacts to the project schedule and
- (iii) Review the resultant critical and near critical paths to determine any impact of the occurrences encountered over the last month.

(4) Schedule Narrative

After finalization of the update, the Contractor will prepare a Narrative that describes progress for the month, impacts to the schedule and an assessment as to the Contractor's entitlement to a time extension for occurrences beyond its control during the month and submit in accordance with this Section.

(5) Progress Meetings

- (a) Review the updated schedule at each monthly progress meeting. Payments to the Contractor may be suspended if the progress schedule is not adequately updated to reflect actual conditions.

- (b) Submit progress schedules to subcontractors to permit coordinating their progress schedules to the general construction work. Include 4 week look ahead schedules to allow subs to focus on critical upcoming work.

3. CRITICAL PATH METHOD (CPM)

- a) This Section includes administrative and procedural requirements for the critical path method (CPM) of scheduling and reporting progress of the Work.
- b) Refer to the General and Special Conditions and the Agreement for definitions and specific dates of Contract Time.
- c) Critical Path Method (CPM): A method of planning and scheduling a construction project where activities are arranged based on activity relationships and network calculations determine when activities can be performed and the critical path of the Project.
- d) Critical Path: The longest continuous chain of activities through the network schedule that establishes the minimum overall project duration.
- e) Network Diagram: A graphic diagram of a network schedule, showing the activities and activity relationships.
- f) Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling, the construction project. Activities included in a construction schedule consume time and resources.
- g) Critical activities are activities on the critical path.

- h) Predecessor activity is an activity that must be completed before a given activity can be started.
- i) Milestone: A key or critical point in time for reference or measurement.
- j) Float or Slack Time: The measure of leeway in activity performance. Accumulative float time is not for the exclusive use or benefit of the Owner or Contractor but is a project resource available to both parties as needed to meet contract milestones and the completion date.
- k) Total float is herein defined as the measure of leeway in starting or completing an activity without adversely affecting the planned project completion date.
- l) Weather: Adverse weather that is normal for the area must be taken into account in the Contractor's Project Schedule. See 1.d.3, above.
- m) Force Majeure Event: Any event that delays the project but is beyond the control and/or contractual responsibility of either party.
- n) Schedule shall include the following, in addition to Contractor's work.
 - (1) Phasing: Provide notations on the schedule to show how the sequence of the Work is affected by the following:
 - (a) Requirements for phased completion and milestone dates.
 - (b) Work by separate contractors.
 - (c) Work by the Owner.
 - (d) Coordination with existing construction.
 - (e) Limitations of continued occupancies.
 - (f) Uninterruptible services.
 - (g) Partial occupancy prior to Substantial Completion.
- o) Area Separations: Use Activity Codes to identify each major area of construction for each major portion of the Work. For the purposes of this Article, a "major area" is a story of construction, a separate building, or a similar significant construction element.

4. TIME EXTENSION REQUEST

- a) Refer to General Conditions of the Contract for Construction, Article 4.7 Claims for Additional Time.
- b) Changes or Other Impacts to the Contractor's Work Plan

The Owner will consider and evaluate requests for time extensions due to changes or other events beyond the control of the Contractor on a monthly basis only, with the submission of the Contractor's updated schedule, in conjunction with the monthly application for payment. The Update must include:

 - (1) An activity depicting the event(s) impacting the Contractors work plan shall be added to the CPM schedule, using the actual start date of the impact, along with actually required predecessors and successors.
 - (2) After the addition of the impact activity(ies), the Contractor will identify subsequent activities on the critical path, with finish to start relationships that can be realistically adjusted to overlap using good, standard construction practice.
 - (a) If the adjustments above result in the completion date being brought back within the contract time period, no adjustment will be made in the contract time.
 - (b) If the adjustments above still result in a completion date beyond the contract completion date, the delay shall be deemed excusable and the contract completion date shall be extended by the number of days indicated by the analysis.
 - (c) Contractor agrees to continue to utilize its best efforts to make up the time caused by the delays. However, the Contractor is not expected to expend costs not contemplated in its contract, in making those efforts.

- c) Questions of compensability of any delays shall be held until the actual completion of the project. If the actual substantial completion date of the project based on excusable delays, excluding weather delays, exceeds the original contract completion date, AND there are no delays that are the responsibility of the contractor to consider, the delays days shall be considered compensable. The actual costs, if any, of the Contractor's time sensitive jobsite supervision and general conditions costs, shall be quantified and a change order issued for these costs.

SHOP DRAWING AND SUBMITTAL LOG

Project: Hill Hall – Building Envelope Repairs

Project Number: MU No. CP220951 / PWA 202224

Contractor:

Section		Submittal No.	Contractor	Action					Remarks	Date Returned	Copies		
				Date Received	#	Date Sent to Consultant	#	Date Returned			Contr	Owner	File
02 4100	DEMOLITION												
	Pre-Demolition Photographs or Video												
04 0100	MAINTENANCE OF MASONRY												
	Product Data - Brick												
	Product Data - Cleaning Compounds												
	Product Data - Water Repellents												
	Product Data - Mortar												
	Product Data - Crack Stitching System												
	Product Data – Anchoring												
	Product Data - Accessories												
	Product Data - Repair Mortar												
	Product Data – Injection Grout												
	Product Data – Stone Consolidation												
	Test Reports - Mortar												
	Samples - Brick												
	Manuf. Instructions - Cleaning Materials												
	Manuf. Instructions - Repair Mortar												
	Manuf. Instructions – Injection Grouting												
	Manuf. Instructions – Stone Consolidation												
	Manuf. Certificate - Brick												
	Restoration Company Qualifications												
	Restoration Worker Qualifications												
	Contractor Work Plan												
04 4313	STONE MASONRY VENEER												
	Product Data												
	Shop Drawings												
	Samples												
05 5000	METAL FABRICATIONS												

SHOP DRAWING AND SUBMITTAL LOG

Section		Submittal No.	Contractor	Action					Remarks	Date Returned	Copies		
				Date Received	#	Date Sent to Consultant	#	Date Returned			Contr	Owner	File
	Shop Drawings												
	Certificates / Qualifications												
05 7000	DECORATIVE METAL												
	Product Data												
	Shop Drawings												
	Delegated Design (Sealed) Drawings												
06 1000	ROUGH CARPENTRY												
	Product Data – Wood Preservative												
06 2000	FINISH CARPENTRY												
	Product Data: Solid Surface												
	Shop Drawings												
07 1400	FLUID-APPLIED WATERPROOFING												
	Product Data												
	Manuf. Instructions												
07 4112	METAL SOFFIT PANELS												
	Product Data												
	Shop Drawings												
	Selection Samples												
	Warranty												
07 6200	SHEET METAL FLASHING AND TRIM												
	Product Data												
	Shop Drawings												
	Samples												
	Sample Finish Warranty												
07 9200	JOINT SEALANTS												
	Product Data - Sealants - Type E-1												
	Product Data - Sealants - Type E-2												
	Product Data - Sealants - Type I-1												
	Product Data - Accessory Products												
	Color Cards for Selection												
	Qualification Data - Installer												
	Qualification Data - Manufacturer												

SHOP DRAWING AND SUBMITTAL LOG

Section		Submittal No.	Contractor	Action					Remarks	Date Returned	Copies		
				Date Received	#	Date Sent to Consultant	#	Date Returned			Contr	Owner	File
08 4313	ALUMINUM-FRAMED ENTRANCES												
	Product Data												
	Shop Drawings												
	Design Data												
	Hardware Schedule												
	Warranty												
08 5113	ALUMINUM WINDOWS												
	Product Data												
	Shop Drawings												
	Manuf. Instructions												
	Field Testing Results												
	Warranty												
08 7100	DOOR HARDWARE												
	Product Data												
	Shop Drawings												
	Manuf. Instructions												
	Maintenance Data												
	Maintenance Materials and Tools												
08 8000	GLAZING												
	Product Data – Type IG-1												
	Product Data – Type Acid Etched IG-1												
	Product Data – Type S1												
	Product Data - Accessories												
	Samples												
	Warranty												
08 9100	LOUVERS												
	Product Data												
	Shop Drawings												
	Samples												
	Test Reports												
	Qualification Data - Manufacturer												

SHOP DRAWING AND SUBMITTAL LOG

Section		Submittal No.	Contractor	Action					Remarks	Date Returned	Copies		
				Date Received	#	Date Sent to Consultant	#	Date Returned			Contr	Owner	File
09 2613	GYPSUM VENEER PLASTERING												
	Product Data												
09 5100	SUSPENDED ACOUSTICAL CEILINGS												
	Product Data												
	Samples												
	Manuf. Instructions												
	Maintenance Materials												
09 6500	RESILIENT FLOORING AND BASE												
	Product Data												
	Samples												
	Maintenance Data												
09 9000	PAINTING AND COATING												
	Product Data												
	Samples												
	Certification - VOC limits												
	Manuf. Instructions												
	Maintenance Data												
12 2400	WINDOW SHADES												
	Product Data												
	Shop Drawings												
	Samples												
	Manuf. Instructions												
	Maintenance Data												
	Warranty												
26 5600	EXTERIOR LIGHTING												
	Product Data												
	Shop Drawings												
	Warranty												
32 1313	CONCRETE PAVEMENT												
	Product Data												
	Design Mixes												
	Test Mix Reports												

CLOSEOUT LOG

Project: Hill Hall – Building Envelope Repairs

Project Number: MU No. CP220951 / PWA 202224

Contractor:

Section	Description	Contractor / Subcontractor	Date Rec/d	# of Copies	CPM Initials	Remarks
GC /3.14	As-built drawings (Field Redlines)					
07 4112	Warranty					
07 6200	Warranty					
07 9200	Warranty					
08 4313	Warranty					
08 5113	Warranty					
08 7100	Maintenance Data					
	Maintenance Materials and Tools					
	Keys					
08 8000	Warranty					
08 9100	Warranty					
09 5100	Maintenance Materials					
09 6500	Maintenance Data					
09 9000	Maintenance Data					
12 2400	Operation and Maintenance Data					
	Warranty					
26 5600	Warranty					

SECTION 1.F

INDEX OF DRAWINGS

Drawings referred to in and accompanying Project Manual consist of following sheets dated October 27, 2023.

CP220951 Hill Hall – Building Envelope Repairs

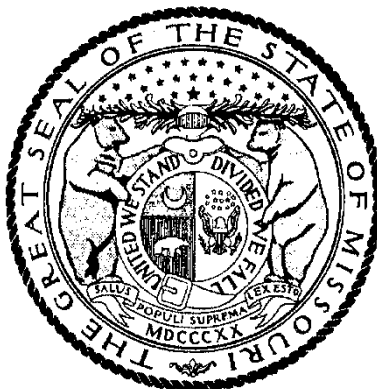
Sheet	1	of	33	G001	COVER SHEET
Sheet	2	of	33	G002	LOCATION MAP, LIST OF DRAWINGS, LEGENDS, BUILDING CODE
Sheet	3	of	33	G101	STAGING PLAN, TRAFFIC CONTROL PLAN
Sheet	4	of	33		FOR INFORMATION ONLY: SURVEY @ EAST ENTRY
Sheet	5	of	33	D101	DEMOLITION: GROUND FLOOR PLAN & DETAILS
Sheet	6	of	33	D102	DEMOLITION: FIRST FLOOR PLAN & ADDITION ROOF PLAN
Sheet	7	of	33	D103	DEMOLITION: SECOND & THIRD FLOOR PLANS
Sheet	8	of	33	D110	DEMOLITION: GROUND FLOOR REFLECTED CEILING PLAN
Sheet	9	of	33	D111	DEMOLITION: FIRST FLOOR REFLECTED CEILING PLAN
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Sheet	27	of	33	A610	DOOR SCHEDULE, WINDOW SCHEDULE, ELEVATIONS, & DETAILS
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Sheet	30	of	33	A613	DOOR, WINDOW, & LOUVER DETAILS
Sheet	31	of	33	ED101	ELECTRICAL DEMOLITION PLAN
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END OF SECTION

Missouri

Division of Labor Standards

WAGE AND HOUR SECTION



MICHAEL L. PARSON, Governor

Annual Wage Order No. 30

Section 010
BOONE COUNTY

In accordance with Section 290.262 RSMo 2000, within thirty (30) days after a certified copy of this Annual Wage Order has been filed with the Secretary of State as indicated below, any person who may be affected by this Annual Wage Order may object by filing an objection in triplicate with the Labor and Industrial Relations Commission, P.O. Box 599, Jefferson City, MO 65102-0599. Such objections must set forth in writing the specific grounds of objection. Each objection shall certify that a copy has been furnished to the Division of Labor Standards, P.O. Box 449, Jefferson City, MO 65102-0449 pursuant to 8 CSR 20-5.010(1). A certified copy of the Annual Wage Order has been filed with the Secretary of State of Missouri.

Original Signed by

Todd Smith, Director
Division of Labor Standards

Filed With Secretary of State: March 10, 2023

Last Date Objections May Be Filed: April 10, 2023

Prepared by Missouri Department of Labor and Industrial Relations

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Asbestos Worker	\$58.05
Boilermaker	\$73.87
Bricklayer	\$53.18
Carpenter	\$49.00
Lather	
Linoleum Layer	
Millwright	
Pile Driver	
Cement Mason	\$47.52
Plasterer	
Communications Technician	\$57.48
Electrician (Inside Wireman)	\$58.51
Electrician Outside Lineman	\$76.79
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Elevator Constructor	\$31.16*
Glazier	\$65.21
Ironworker	\$65.92
Laborer	\$42.86
General Laborer	
First Semi-Skilled	
Second Semi-Skilled	
Mason	\$31.16*
Marble Mason	
Marble Finisher	
Terrazzo Worker	
Terrazzo Finisher	
Tile Setter	
Tile Finisher	
Operating Engineer	\$64.73
Group I	
Group II	
Group III	
Group III-A	
Group IV	
Group V	
Painter	\$40.26
Plumber	\$69.73
Pipe Fitter	
Roofer	\$53.14
Sheet Metal Worker	\$56.02
Sprinkler Fitter	\$61.21
Truck Driver	\$31.16*
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

*The Division of Labor Standards received fewer than 1,000 reportable hours for this occupational title. The public works contracting minimum wage is established for this occupational title using data provided by Missouri Economic Research and Information Center.

**The Prevailing Hourly Rate includes any applicable fringe benefit amounts for each occupational title as defined in RSMO Section 290.210.

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Carpenter	\$53.37
Millwright	
Pile Driver	
Electrician (Outside Lineman)	\$76.79
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Laborer	\$46.32
General Laborer	
Skilled Laborer	
Operating Engineer	\$65.15
Group I	
Group II	
Group III	
Group IV	
Truck Driver	\$31.16*
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

Use Heavy Construction Rates on Highway and Heavy construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(3).

Use Building Construction Rates on Building construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(2).

If a worker is performing work on a heavy construction project within an occupational title that is not listed on the Heavy Construction Rate Sheet, use the rate for that occupational title as shown on the Building Construction Rate Sheet.

*The Division of Labor Standards received fewer than 1,000 reportable hours for this occupational title. Public works contracting minimum wage is established for this occupational title using data provided by Missouri Economic Research and Information Center.

**The Prevailing Hourly Rate includes any applicable fringe benefit amounts for each occupational title.

OVERTIME and HOLIDAYS

OVERTIME

For all work performed on a Sunday or a holiday, not less than twice (2x) the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work.

For all overtime work performed, not less than one and one-half (1½) the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work or contractual obligation. For purposes of this subdivision, "**overtime work**" shall include work that exceeds ten hours in one day and work in excess of forty hours in one calendar week; and

A thirty-minute lunch period on each calendar day shall be allowed for each worker on a public works project, provided that such time shall not be considered as time worked.

HOLIDAYS

January first;
The last Monday in May;
July fourth;
The first Monday in September;
November eleventh;
The fourth Thursday in November; and
December twenty-fifth;

If any holiday falls on a Sunday, the following Monday shall be considered a holiday.

LEAD-BASED PAINT MATERIALS REMOVAL AND DISPOSAL

PART 1 - GENERAL

Provisions of the General Conditions and Special Conditions are part of this Division.

1.1 WORK COVERED BY CONTRACT DOCUMENTS

- 1.1.1 The Contractor shall inform him/herself of the conditions for the project, and is responsible for verifying the quantities and location of all work to be performed as outlined in this section. Failure to do so shall not relieve the Contractor of his obligation to furnish all materials and labor necessary to carry out the provisions of the Contract. The work of the Contract can be summarized as follows:

The work consists of the proper removal and disposal of the following approximate quantities of windows, window frames, windowsills, window jambs, and window muntins painted with Lead-Based Paint (LBP) for the Hill Hall Building Envelop Upgrades - MU Project Number CP220951:

1. North Elevation - Approximately 32 windows/window openings, including frames, sills, jambs and muntins, painted with lead-based paint on all floors (Ground, 1st, 2nd, and 3rd) of the facility.
2. South Elevation - Approximately 29 windows/window openings, including frames, sills, jambs and muntins, painted with lead-based paint on all floors (Ground, 1st, 2nd, and 3rd) of the facility.
3. West Elevation - Approximately 52 windows/window openings, including frames, sills, jambs and muntins, painted with lead-based paint on all floors (Ground, 1st, 2nd, and 3rd) of the facility.
4. East Elevation - Approximately 47 windows/window openings, including frames, sills, jambs and muntins, painted with lead-based paint on all floors (Ground, 1st, 2nd, and 3rd) of the facility.

The entire window component, including sills, shall be removed completely and as intact as possible.

It should be noted that the above referenced windows also contain asbestos-containing window caulking and glazing. These Asbestos-Containing Materials will need to be addressed as part of this project. Please reference the Friable and Non-Friable Asbestos Removal Specification Section (028233) for additional information.

1.2 CODES AND REGULATIONS:

- 1.1.2.1 All applicable codes, regulations, standards, statutes, laws, and rules have the same force and effect (and are made a part of the contract documents by reference) as if copied directly into the contract documents, or as if published copies are bound herewith. Where conflicts arise, the most stringent specification shall apply.
- 1.1.2.2 Federal and State requirements which govern lead-based paint removal work or hauling and disposal of such waste materials include but are not limited to the following:

LEAD-BASED PAINT MATERIALS REMOVAL AND DISPOSAL

1.1.2.2.1 U.S. Department of Labor, Occupational Health and Safety Administration (OSHA), 29 CFR 1910 and 29 CFR 1926.

1.1.2.2.1.1 Construction Industry - 29 CFR 1926.1101

1.1.2.2.1.2 Respiratory Protection – 29 CFR 1910.134

1.1.2.2.1.3 Hazard Communication – 29 CFR 1910.1200

1.1.2.2.1.4 Accident Prevention Signs – 29 CFR 1910.145

1.1.2.2.2 U.S. Environmental Protection Agency (EPA)

1.1.3 **CONTRACTOR'S DUTIES**

1.1.3.1 Except as specifically noted, provide and pay for:

- Labor, materials, and equipment.
- Tools, construction equipment, and machinery.
- Other facilities and services necessary for proper execution and completion of work.

1.1.3.2 Pay legally required sales, consumer, use, payroll, privilege and other taxes. Retail sales tax shall not be included in the bid amount.

1.1.3.3 Secure and pay for, as necessary for proper execution and completion of work, and as applicable at the time of bids:

- Permits
- Government Fees
- Licenses
- Except where specifically noted, provide and pay for waste disposal permits and costs

1.1.3.4 Give required notices.

1.1.3.5 Contractor shall assume full responsibility and liability for compliance with all codes, ordinances, rules, regulations, orders and other legal requirements of Local, State, and Federal public authorities including Environmental Protection Agency (EPA) regulations, Missouri Department of Natural Resources (MDNR) and Occupational Safety and Health Administration (OSHA) which bear on performance work. Where conflicts occur between these specifications and/or the above-mentioned regulations, the more stringent shall govern. The Contractor shall hold the owner and owner's air monitoring firm harmless for failure to comply with any applicable work, hauling, safety, health, or other regulations on the part of the contractor, contractor's employees, or contractor's subcontractors.

1.1.3.6 If the Contractor observes that any of the Contract Documents are at variance therewith in any respect, he shall promptly notify MU in writing, and any necessary changes shall be accomplished by appropriate modification. It is not the Contractor's responsibility to

LEAD-BASED PAINT MATERIALS REMOVAL AND DISPOSAL

make certain that the Contract Documents are in accordance with applicable laws, statutes, building codes and regulations. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to MU, he shall assume full responsibility therefore and shall bear all cost attributable thereto.

1.1.3.7 Enforce strict discipline and good order among employees. Do not employ unfit persons or persons not skilled in assigned task.

1.1.3.8 Comply with all applicable federal, state, and local laws regarding job discrimination and payment of prevailing wage rates for the base bid.

1.1.3.9 The use of the best available technology, procedures, and methods for preparation, execution, cleanup, disposal, and safety are absolutely required. This compliance is the sole responsibility of the abatement contractor.

1.1.3.10 Assume responsibility for the proper and safe execution of the work.

1.1.8 **COORDINATION**: The General Contractor shall be responsible for the coordination of the LBP removal and window replacement for this project. The lead remediation contractor shall coordinate with all other on-site contractors and all subcontractors working under separate contracts so as to facilitate the general progress of the work. Each trade shall afford all trades every reasonable opportunity for the installation of their work.

1.2 STOP WORK

1.2.1 If the Owner, or his designated representative, presents a written or verbal stop work order, immediately stop all work or that portion of the work designated. A verbal stop work order shall be confirmed by a written stop work order within 24 hours. Do not commence referenced work until authorized in writing by the Owner or his representative.

1.3 CONTRACTOR USE OF PREMISES

1.3.1 **GENERAL**: During the construction period, the lead remediation contractor will have access to planned renovations area in Hill Hall for construction operations. Other areas of the building will be strictly off limits to the lead remediation contractor.

1.3.2 **USE OF THE SITE**: Confine operations at the site to the areas permitted under the Contract. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the work while engaged in project construction.

1.3.2.1 Keep existing driveways and entrances serving the premises clear and available to the Owner and his employees at all times.

1.3.2.2 Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage to areas

LEAD-BASED PAINT MATERIALS REMOVAL AND DISPOSAL

acceptable to Owner. If additional storage is necessary, obtain and pay for such storage off-site.

- 1.3.2.3 Do not load structure with weight that will endanger structure.
- 1.3.2.4 Assume full responsibility for protection and safekeeping of products stored on premises.
- 1.3.2.5 Move any stored products which interfere with operations of Owner or other contractors.
- 1.3.2.6 Contractor personnel shall utilize only those entrances/exits and parking lots designated by the Owner.
- 1.3.2.7 Contractor shall utilize only those areas designated by the Owner for the storage of equipment and the placement of dumpsters/transport containers.
- 1.3.2.8 Take all cautions necessary to ensure there is no lead contamination to those areas not included in work schedule. Should areas outside the work area become contaminated with hazardous materials, the Contractor shall immediately clean them utilizing the wet cleaning and HEPA vacuum methods specified herein. The hazard remediation contractor is responsible for the proper cleanup of all items in the work areas to maintain a clean and safe environment.

1.3.3 **CONTRACTOR'S USE OF THE EXISTING BUILDING:** Maintain the existing building in a safe and weather tight condition throughout the construction period. Take all precautions necessary to protect the building and its occupants during the construction period.

- 1.3.3.1 Keep areas such as walkways and stairs free from accumulation of waste material, rubbish or construction debris.
- 1.3.3.2 Smoking or open fires are prohibited within the building or on the premises.

1.4 **OWNER OCCUPANCY**

1.4.1 **PARTIAL OWNER OCCUPANCY:** The Owner reserves the right to occupy areas of the building in which lead removal has been completed, provided that such occupancy does not substantially interfere with completion of the work. The Owner also reserves the right to occupy portions of the building not involved in this Scope of Work. Such partial occupancy shall not constitute acceptance of the work or any part of the work. The Owner shall also maintain the right to access areas where no work is being performed.

2.1 **SUBMITTAL REQUIREMENTS**

- 2.1.1 The following will be submitted by the contractor prior to commencement of work for approval by Owner's Certified Industrial Hygienist (one copy for the Owner's Representative). The Owner's C.I.H. will return reviewed copies to contractor and Owner's Representative.

LEAD-BASED PAINT MATERIALS REMOVAL AND DISPOSAL

- 2.1.1.1 One copy of any Safety Data Sheets (SDS) for products to be used by the contractor in the performance of his work. Contractor will also maintain copies of SDS on site per OSHA.
 - 2.1.2 Submit the following for all Supervisor(s) and Workers who will be on the project site prior to commencement of work:
 - 2.1.2.1 A list of project personnel and contact phone numbers
 - 2.1.2.2 Current training certificates, either EPA RRP training or State of Missouri lead licenses
 - 2.1.2.3 Physician's Statement that each person is physically fit to wear a respirator
 - 2.1.2.4 Respirator Fit Test
 - 2.1.3 Submit a detailed plan of the procedures proposed for use in complying with requirements of this specification. Include in the plan the layout and location of work areas, route of ingress and egress for the work areas, methods used to assure safety of building occupants and visitors, method of removal of material, and disposal container requirements for lead based paint material to be disposed.
 - 2.1.4 Proposed disposal site for lead-based paint materials, including a disposal plan to detail type of disposal container, method of transportation to disposal site, and waste hauler.
 - 2.1.5 Any other submittals as required by MU.
 - 2.1.6 Upon completion of the LBP removal, submit to the Owner's Representative, copies of hazardous materials shipping records, disposal receipts, incineration documentation, etc. for all LBP removed from the project site.
 - 2.1.7 Upon completion of the LBP removal, the following information shall be submitted by the Owner's C.I.H. to the contractor:
 - 2.1.7.1 Construction and demolition waste landfill receipts, disposal receipts, truck tickets, incineration/recycling receipts and documentation.
 - 2.1.7.2 Written visual certification from the Owner's Certified Industrial Hygienist that LBP material have been removed from the facility.
 - 2.2 **TERMINOLOGY** (Definitions)
 - 2.2.1 **APPROVED Construction and Demolition WASTE DISPOSAL SITE:** A permitted solid waste landfill that is authorized by the Missouri Department of Natural Resources to receive LBP wastes.
 - 2.2.2 **AUTHORIZED VISITOR:** The Building Owner, the Building Owner's representative, MU personnel, or a representative of any regulatory or other agency having jurisdiction over the project.
 - 2.2.3 **BARRIER:** Any surface that seals off the work area to non-authorized personnel
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LEAD-BASED PAINT MATERIALS REMOVAL AND DISPOSAL

from entering the work area.

- 2.2.4 **BUILDING OWNER**: A representative of the University of Missouri.
- 2.2.5 **DISPOSAL CONTAINER**: A properly labeled container for universal/hazardous materials. The proposed disposal container for lead-based paint will be provided to the Owner's Representative and part of the hazard remediation contractor's pre-work
- 2.2.6 **HEPA VACUUM EQUIPMENT**: High efficiency particulate air filtered vacuuming equipment with a filter system capable of collecting and retaining hazardous particulates. Filters should be of 99.97% efficiency for retaining particulates greater than 0.3 microns.
- 2.2.7 **ON-SITE REPRESENTATIVE**: MU's full-time representative responsible for air monitoring and enforcement of the specifications.
- 2.2.8 **OWNER'S CERTIFIED INDUSTRIAL HYGIENIST (C.I.H.)**: An Industrial Hygienist, certified in comprehensive practice by the American Board of Industrial Hygiene (ABIH).
- 2.2.9 **HAZARDOUS MATERIAL SHIPMENT RECORD/DISPOSAL RECEIPT**: The shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of universal/hazardous materials.
- 2.2.10 **WET CLEANING/WIPING**: The process of eliminating contamination from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with water, and by afterwards disposing of these cleaning tools as necessary.
- 2.2.11 **WORK AREA**: A specific isolated area in which lead painted materials are required to be handled. The area is designated as a work area from the time that the area is secured and access restrictions are in place. The area remains designated as a work area until the time that it has been cleaned in accordance with any requirements applicable to the operations conducted.

2.3 EXISTING CONDITIONS

- 2.3.1 Building Owner and Contractor shall agree on building conditions prior to commencement of work. It shall be the Contractor's responsibility to replace or repair to the Owner's satisfaction, prior to close-out of the project, all damaged items caused by the Contractor and not proven otherwise. All items damaged prior to remediation shall be noted during preconstruction walk-through.

3.1 PERSONNEL PROTECTION REQUIREMENTS

- 3.1.1 Prior to commencement of work, the workers shall be instructed and shall be knowledgeable on the hazards of LBP materials involved and other environmental exposures, use and fitting of respirators, protective clothing, decontamination procedures, and all aspects of remediation work procedures; workers shall have medical examinations.

LEAD-BASED PAINT MATERIALS REMOVAL AND DISPOSAL

- 3.1.2 The Contractor acknowledges that he alone is responsible for enforcing personnel protection requirements and that these specifications provide only a minimum acceptable standard for each phase of operation.
- 3.1.3 If required or requested of the workers, provide workers with personally issued and marked respiratory equipment approved by NIOSH and accepted by OSHA.
- 3.1.4 No visitors shall be allowed in work areas, except as authorized.
- 3.1.5 Where required or if requested by the workers, provide workers with sufficient sets of disposable protective full-body clothing. Such clothing shall consist of full-body coveralls, footwear, and head gear, one-piece coveralls or equal. Provide eye protection and hard hats as required by applicable safety regulations. Disposable clothing shall not be allowed to accumulate and shall be disposed of as contaminated waste.
- 3.1.6 Provide authorized visitors with suitable protective clothing, headgear, footwear, and gloves as described above whenever they are required to enter the work area.

3.2 MATERIALS

- 3.2.1 Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name.
 - 3.2.1.1 Store all materials subject to damage off the ground, away from wet or damp surfaces, and under cover sufficient to prevent damage or contamination.
 - 3.2.1.2 Damaged or deteriorating materials shall not be used and shall be removed from the premises.
- 3.2.2 **PLASTIC SHEETING**: A minimum 6-mil (or as specified).
- 3.2.3 **TAPE**: Capable of sealing joints of adjacent sheets of polyethylene and for attachment of polyethylene sheets to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water, duct tape, poly prep tapes or approved equal.
- 3.2.4 **ADHESIVES**: Capable of sealing joints of adjacent sheets of polyethylene and for attachment of polyethylene sheet to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water.
- 3.2.5 **IMPERMEABLE CONTAINERS**: Suitable to receive and retain any hazardous materials until disposal by the owners rep. The containers shall be labeled as required by owner. Containers must be resistant to damage and rupture.
- 3.2.6 **WARNING LABELS AND SIGNS**: As required by owner.
- 3.2.7 **OTHER MATERIALS**: Provide all other materials, such as, but not limited to lumber, plywood, nails, and hardware, which may be required to properly prepare and complete this project.

LEAD-BASED PAINT MATERIALS REMOVAL AND DISPOSAL

3.3 TOOLS AND EQUIPMENT

3.3.1 Provide suitable tools for universal/hazardous waste removal and disposal.

3.3.1.1 Water Sprayer: Airless or a low pressure sprayer for amended water application as applicable.

3.3.1.2 Air-Purifying Equipment: High Efficiency Particulate Air Filtration Systems (HEPA) shall comply with ANSI Z9.2-91. No air movement system or air equipment should discharge particulates outside the work area. Thus, the negative air unit shall be equipped with a three filter bank with the last being the HEPA filter capable of removing 99.97% of fibers/particulates >0.3 microns.

3.3.1.3 Scaffolding: As required to accomplish the specified work and meet all applicable safety regulations.

2.3.1.4 Vacuums: Use HEPA type from a known manufacturer.

2.3.1.5 Other tools and equipment as necessary.

3.4 SUPERVISION OF LEAD-BASED PAINT REMOVAL

3.4.1 The contractor shall designate a competent supervisor subject to the approval of the Owner's C.I.H. and the Owner's Representative. The supervisor shall be the Contractor's representative on the project, shall meet the requirements of all applicable regulations, and perform or meet the following minimum requirements:

3.4.1.1 Be knowledgeable in all aspects of removal, cleanup and proper disposal of LBP as listed in the Scope of Work.

3.4.1.2 Be onsite and supervise all removal, cleanup and disposal activities.

3.4.1.3 Maintain a daily log on the project documenting events, violations, problems, equipment failures, accidents, and inspections.

3.4.1.4 Be responsible for implementation of first aid, safety training, respiratory protection, and ensuring all workers are trained in emergency procedures.

3.4.1.5 Be responsible for conducting a visual inspection of the work area prior to a visual inspection by the Owner's Certified Industrial Hygienist. Inspection shall be documented.

3.5 WORKER PROTECTION / TRAINING

3.5.1 The contractor shall be responsible for providing his employees with proper respiratory protection, respiratory training, a written respirator program, medical examinations, maintaining medical records, protective clothing and equipment to comply with OSHA requirements, if necessary

LEAD-BASED PAINT MATERIALS REMOVAL AND DISPOSAL

- 3.5.2 All workers shall be trained in the dangers inherent in handling LBP, and hazardous materials, in proper work procedures, and personal protective measures.

3.6 OWNER'S CERTIFIED INDUSTRIAL HYGIENIST

- 3.6.1 It will be the Owner's responsibility to contract with a Certified Industrial Hygienist or Environmental Consulting firm. The Certified Industrial Hygienist/Environmental Consulting firm will also be required to perform the following duties as a minimum:

- 3.6.1.1 Approval of the Contractor's work plan and methods of remediation to meet regulatory requirements and ensure the health and safety of University faculty, staff, and students.
- 3.6.1.2 Verify that the Contractor is satisfactorily performing the work in accordance with OSHA regulations.
- 3.6.1.3 Visual inspection of the work areas.
- 3.6.1.4 Certify in writing that the Contractor's procedures, methods, and practices were, to the best of his/her knowledge and belief, in compliance with current EPA, OSHA, State, and Local applicable regulations, that the work areas meet the requirements for a final visual inspection prior to re-occupancy, and an accounting of any known deviations.

3.7 SEPARATION OF WORK AREAS FROM NONWORK AREAS

- 3.7.1 Visual separation shall be accomplished at all "see-through" locations using opaque polyethylene. This separation shall not be incorporated within the other seals involved on this project.

3.8 EMERGENCY PROTECTION PLAN / FIRE EXITS

- 3.8.1 The contractor shall be responsible for developing a written Emergency Protection Plan and shall maintain this plan onsite. The plan shall include considerations of fire, explosion, toxic atmospheres, electrical hazards, slips, falls, and heat related injury. All employees shall be instructed and trained in the procedures.
- 3.8.2 The Emergency Protection Plan shall also include written notification of police, fire, and medical personnel of the planned remediation activities, work schedule, and layout of the work area, particularly barriers that may affect response capabilities.
- 3.8.3 Designate and maintain emergency and fire exits from the work area in accordance with local codes and regulations. All exits shall be clearly marked with fluorescent tape or red paint and shall be clearly visible from any part of the work area.

3.9 LOCAL AREA PROTECTION / SITE SECURITY

LEAD-BASED PAINT MATERIALS REMOVAL AND DISPOSAL

- 3.9.1 The contractor shall secure the work areas to make sure of no inadvertent entry. Any breach to the exterior of the building shall be secured by the hazard remediation contractor. The Contractor shall be responsible for maintaining security of the remediation areas throughout the contract period.
- 3.9.2 The contractor shall be responsible for all areas of the building used by contractor and/or subcontractors in the performance of the work. Contractor shall exert full control over the actions of all employees and other persons with respect to the use and preservation of the existing building, except such controls as may be specifically reserved to the owner.
- 3.9.3 Contractor has the right to exclude from the work area all persons who have no purpose related to the work or its inspection, and shall require all persons in the work area to observe the same regulations required of Contractor's employees.
- 3.9.4 The contractor shall have control of site security during remediation operations in order to protect the work environment and equipment. Contractor shall have the owner's assistance in notifying building occupants of impending activity and enforcement of restricted access by owner's employees.
- 3.9.5 The contractor shall keep a minimum of two (2) 10lb type ABC fire extinguishers onsite. One shall be maintained outside the work area and one inside each work area. Contractor employees shall be trained in the operation of fire extinguishers.
- 3.9.6 For the interior of the building during window removal activities, the abatement contractor shall construct a containment consisting of 6-mil polyethylene sheeting and sufficient framing, including a minimum of one (1) layer of polyethylene on the walls, floor and ceiling. A minimum of a one (1) chamber decontamination unit shall be attached to each containment. Depending upon the size of the containment, install a sufficient number of HEPA-filtered negative air machine(s) to establish a minimum of 4 air exchanges per hour. Based on coordination with the Owner and General Contractor, the containment can be installed around each window, around a group of windows, or around one whole side of the floor. The containment must be installed in such a manner to prevent damage to existing walls, floors, or ceilings.
- 3.9.7 The Contractor shall provide warning signage around the regulated area as required by OSHA.
- 3.9.8 The Contractor shall isolate any and all air supply and returns to the abatement space as required by OSHA. Contractor shall coordinate with the Owner's Representative.
- 3.9.9 The Contractor shall erect barrier tape and install polyethylene drop cloths on the ground on the exterior of the facility directly below where the windows are being removed. The barrier tape and polyethylene drop cloths shall extend, a minimum of ten feet, beyond the drop zone of any window debris.

LEAD-BASED PAINT MATERIALS REMOVAL AND DISPOSAL

- 3.9.10 The contractor shall maintain the work area free from rubbish, debris, and dirt, and keep a clean, safe working area.

3.10 LEAD-BASED PAINT REMOVAL OPERATIONS

- 3.10.1 **MATERIALS PAINTED WITH LEAD-BASED** – It is anticipated that the windows, window jambs, window frames, window sills, and window muntins will be removed as part of the Building Envelop Upgrades project. It is anticipated that these items will be properly removed, containerized, and hauled away and disposed of in a landfill approved by the State of Missouri to accept lead waste material. These areas should be sealed off with polyethylene sheeting over the doors, vents, windows, or any other openings into/out of the area.

3.11 REESTABLISHMENT OF THE WORK AREA

- 3.11.1 Reestablishment of the work area shall only occur after the Contractor has received a final visual inspection from the Owner's C.I.H./Environmental Consulting firm documenting that the lead waste materials have been removed from the project site.

END OF SECTION

SECTION 02 4100
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Selective demolition of building elements for alteration purposes.

1.02 REFERENCE STANDARDS

- A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.
- B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2019.

1.03 SUBMITTALS

- A. See Division One for submittal procedures.
- B. Pre-demolition Photographs or Video: Show existing conditions of adjoining construction and site improvements. Include finish surfaces and other items that might be misconstrued as damage caused by demolition operations.

1.04 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: Company specializing in the type of work required.
 - 1. Minimum of five years of documented experience.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 SCOPE

- A. Remove the entire portion of building designated on drawings..

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. Comply with all requirements specified in Division One.
- B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
 - 1. Obtain required permits.
 - 2. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
 - 3. Maintain fire watch during and for at least 24 hours after flame-cutting operations.
 - 4. Maintain adequate ventilation when using cutting torches.
 - 5. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - 6. University has a Title V Permit that states that no fugitive particulate matter emissions shall go beyond the premise of origin in the quantities that the particulate matter may be found on surfaces beyond the property line of origin. Conduct demolition operations to comply with University's Title V Permit regulations.
 - 7. Comply with applicable requirements of NFPA 241.
 - 8. Use of explosives is not permitted.
 - 9. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
 - 10. Provide, erect, and maintain temporary barriers and security devices.
 - 11. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.

12. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 13. Do not close or obstruct roadways or sidewalks without permit.
 14. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
 15. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
- C. Do not begin removal until receipt of notification to proceed from Owner.
- D. Protect existing structures and other elements that are not to be removed.
1. Provide bracing and shoring.
 2. Prevent movement or settlement of adjacent structures.
 3. Stop work immediately if adjacent structures appear to be in danger.
- E. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- F. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

3.03 SELECTIVE DEMOLITION FOR ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
1. Verify that construction and utility arrangements are as indicated.
 2. Report discrepancies to Architect before disturbing existing installation.
 3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
- B. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
- C. Remove existing work as indicated and as required to accomplish new work.
1. Remove items indicated on drawings.
- D. Protect existing work to remain.
1. Prevent movement of structure; provide shoring and bracing if necessary.
 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 3. Repair adjacent construction and finishes damaged during removal work.
 4. Patch as specified for patching new work.

3.04 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Leave site in clean condition, ready for subsequent work.
- C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

FRIABLE AND NON-FRIABLE ASBESTOS REMOVAL

PART 1 - GENERAL

Provisions of the General Conditions and Special Conditions are part of this Division.

1.1 SCOPE OF WORK

1. General: The work specified herein shall be the abatement of asbestos-containing materials by certified and registered persons who are knowledgeable, qualified and trained in the abatement, handling, and disposal of asbestos containing material, and subsequent cleaning of the affected environment.

2. The Contractor shall furnish all labor, material, equipment, testing, services, permits, insurance, notifications, necessary or required to perform the work in accordance with applicable local, state, and federal regulations for the abatement of asbestos-containing materials and for other work as specified in this section or as indicated in associated drawings, sketches, or reports of the work.

All fees required for notification requirements, renotifications, and/or inspections by the regulatory agencies shall be paid by the Contractor. Bulk sample analysis information required by the Department of Natural Resources, U.S. Environmental Protection Agency or local authority having jurisdiction in conjunction with the notification shall also be provided by the Contractor unless provided within this section.

3. The work shall include the removal and legal disposal of friable and non-friable asbestos-containing materials. The same materials can be included in both the friable asbestos section and the non-friable asbestos section in that the window caulking and glazing can both be considered friable and non-friable. However, due to the age of the material and the exposure to the elements over the years, for the purposes of this project, these materials are considered friable.

A. Friable asbestos:

The contractor shall remove and legally dispose of a total of approximately 160 windows/window openings at the following elevations:

1. North Elevation - Approximately 32 windows/window openings with asbestos-containing caulk present between the window frames and the building and asbestos-containing glazing between the glass pane and window frame on all floors (Ground, 1st, 2nd, and 3rd) of the facility.
2. South Elevation - Approximately 29 windows/window openings with asbestos-containing caulk present between the window frames and the building and asbestos-containing glazing between the glass pane and window frame on all floors (Ground, 1st, 2nd, and 3rd) of the facility.
3. West Elevation - Approximately 52 windows/window openings with asbestos-containing caulk present between the window frames and the building and asbestos-containing glazing between the glass pane and window frame on all floors (Ground, 1st, 2nd, and 3rd) of the facility.

FRIABLE AND NON-FRIABLE ASBESTOS REMOVAL

4. East Elevation - Approximately 47 windows/window openings with asbestos-containing caulk present between the window frames and the building and asbestos-containing glazing between the glass pane and window frame on all floors (Ground, 1st, 2nd, and 3rd) of the facility.

The complete window component shall be removed completely and as intact as possible.

It should be noted that the above referenced windows are also painted with Lead-Based Paint. This Lead-Based Paint will need to be addressed as part of this project. Please reference the Lead-Based Paint Specification Section (020810) for additional information.

1.2 DEFINITIONS

1. Abatement - Procedures to decrease or eliminate the source of fiber release from asbestos containing building materials. Includes encapsulation, enclosure, and removal.
2. Adequately Wet - To sufficiently mix or penetrate with liquid to prevent the release of particulate.
3. Aggressive Air Sampling - Sweeping of floors, ceilings and walls and other surfaces with the exhaust of a minimum of one (1) horsepower leaf blower or equivalent immediately prior to air monitoring.
4. Approved Waste Disposal Site - A solid waste disposal area that is authorized by the Department of Natural Resources to receive asbestos containing solid wastes.
5. Asbestos - The asbestiform varieties of serpentine (chrysotile, antigorite), riebeckite (crocidolite), cummingtonite-grunerite (amosite), anthophyllite, and actinolite-tremolite.
6. Asbestos Abatement Supervisor - An individual who directs, controls, or supervises others in asbestos abatement projects.
7. Asbestos-Containing Building Material (ACBM) - Surfacing ACM, thermal system insulation ACM, or miscellaneous ACM that is found in or on interior structural members or other parts of a building.
8. Asbestos-Containing Material (ACM) - Any material containing more than 1 percent asbestos by weight.
9. Barrier - Any surface that seals off the work area to inhibit the movement of fibers.
10. Category I Nonfriable ACM - Asbestos-containing packings, gaskets, resilient floor covering and asphalt roofing products containing more than one percent (1%) asbestos as determined using the method specified in 40 CFR part 763, subpart F, Appendix A, section 1, Polarized Light Microscopy.

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11. Category II Nonfriable ACM - Any material, excluding category I nonfriable ACM, containing more than one percent (1%) asbestos as determined using the methods specified in 40 CFR part 763, subpart F, Appendix A, section 1, Polarized Light Microscopy that, when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure.
12. Containment - Area where asbestos abatement project is conducted. Area must be enclosed either by a glove bag or plastic sheeting barrier.
13. Contractor's Competent Person (Qualified Person) - One who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, as specified in 29 CFR 1926.32 (f); in addition, for Class I, II, III, and IV work, who is specially trained in training courses which meet the criteria of EPA's Model Accreditation Plan (40 CFR Part 763) for project designer or supervisor, or its equivalent.
14. Decontamination Area - Enclosed area adjacent and connected to the regulated area which is used for decontamination of workers, materials, and equipment that are contaminated with asbestos.
15. Demolition - the wrecking or taking out of any load bearing structural member of a facility together with any related handling operations.
16. Disposal Bag - A properly labeled 6 mil. thick, leak-tight plastic bag used for transporting asbestos waste from work area to disposal site.
17. Encapsulant (Sealant) - A liquid material which can be applied to asbestos-containing material and which prevents the release of asbestos fibers from the material either by creating a membrane over the surface or by penetrating into the material and binding its components together.
18. Encapsulation - Treatment of asbestos containing materials with an encapsulant.
19. Enclosure - The construction of an airtight, impermeable, permanent barrier around asbestos containing material to control the release of asbestos fibers into the air.
20. Friable Asbestos Material - Any material containing more than one percent asbestos as determined using the method specified in appendix A, subpart F, 40 CFR part 763 section 1, Polarized Light Microscopy, that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.
21. Glove Bag - A manufactured or fabricated device, typically constructed of six (6) mil transparent polyethylene or polyvinyl chloride plastic. This device consist of two (2) inward projecting long sleeves, an internal tool pouch and an attached, labeled receptacle for asbestos waste.
22. Homogeneous Work Site - Continuous areas with the same type of ACM and in which one type of abatement process is performed.
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FRIABLE AND NON-FRIABLE ASBESTOS REMOVAL

23. Negative Initial Exposure Assessment - An assessment by a "Competent Person" in which it is concluded that employee exposures during the job are likely to be consistently below the Permissible Exposure Levels.

24. Outside Air - Air outside of the containment.

25. Owner's Air Monitoring Firm - Air Monitoring conducted by a person who is not under the direct control of the person carrying out the asbestos abatement project and who has been selected by the Owner.

26. Owner's Air Sampling Professional - An individual who holds a valid certification from the State of Missouri. The individual shall conduct, oversee, or be responsible for air monitoring of asbestos abatement projects before, during, and after the project has been completed. The air sampling professional should have a 40 hour AHERA Asbestos Contractor/Supervisor Certificate or equivalent training, and supervised by the Owner's Certified Industrial Hygienist (C.I.H.).

27. Owner's Air Sampling Technician - An individual who has been trained by and is under the supervision of an air sampling professional to do air monitoring before, during, and after the asbestos abatement project. The air sampling technician should have a 40 hour AHERA Asbestos Contractor/Supervisor Certificate or equivalent training, and be supervised by the Owner's Certified Industrial Hygienist (C.I.H.).

28. Owner's Certified Industrial Hygienist (C.I.H.) - an Industrial Hygienist, Certified in Comprehensive Practice by the American Board of Industrial Hygiene. The Owner's C.I.H. must also be certified by the Missouri Department of Natural Resources as an air sampling professional and hold a 40 hour AHERA Asbestos Contractor/Supervisor Certificate. The Owner will identify C.I.H. before application for permit.

29. Personal Monitoring - Sampling of the asbestos fiber concentrations within the breathing zone.

30. Regulated Asbestos-Containing Material (RACM) - Friable asbestos material; Category I nonfriable ACM that has become friable; Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading; Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

31. Remove - To take out RACM or facility components that contain or are covered with RACM from any facility.

32. Renovation - Altering a facility or one or more facility components in any way, including the stripping or removal of RACM from a facility component.

33. Repair - The restoration of asbestos material that has been damaged. Repair consists of the application of rewettable glass cloth, canvas, cement or other suitable material. It may also involve filling damaged areas with non-asbestos substitutes and re-encapsulating or painting previously encapsulated materials.

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34. Strip - To take off RACM from any part of a facility or facility components.

35. Waste Shipment Record - The shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of asbestos containing waste material.

36. Work Area - A specific isolated area, other than the space enclosed within a glove bag, in which friable asbestos-containing materials is required to be handled. The area is designated as a work area from the time that the area is secured and access restrictions are in place. The area remains designated as a work area until the time that it has been cleaned in accordance with any requirements applicable to the operations conducted.

1.3 CODES AND REGULATIONS

1. General Applicability Of Codes, Regulations and Standards - All applicable codes, regulations, standards, statutes, laws, and rules have the same force and effect (and are made a part of the contract documents by reference) as if copied directly into the contract documents, or as if published copies are bound herewith. Where conflicts arise, the most stringent specification shall apply.

2. Contractor Responsibility - The Contractor shall assume full responsibility and liability for the compliance with all applicable federal, state, and local regulations pertaining to work practices, hauling, disposal and protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable federal, state, and local regulations. The Contractor shall hold the owner harmless for failure to comply with any applicable work, hauling, disposal, safety, health, or other regulations on the part of the contractor, contractor's employees, or contractor's subcontractors.

3. Federal and State requirements which govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:

1. U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) including but not limited to:

1. Title 29, Part 1910, Section 1001 and Part 1926, Section 1101 of the Code of Federal Regulations.

2. Respiratory Protection, Title 29, Part 1910, Section 134 of the Code of Federal Regulations.

3. Construction Industry, Title 29. Part 1926, of the Code of Federal Regulations.

4. Access to Employee Exposure and Medical Records, Title 29, Part 1910, Section 2 of the Code of Federal Regulations.

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5. Hazard Communication, Title 29, Part 1910, Section 1200 of the Code of Federal Regulations.

6. Specifications for Accident Prevention Signs and Tags, Title 29, Part 1910, Section 145 of the Code of Federal Regulations.

2. U.S. Environmental Protection Agency (EPA) including but not limited to:

1. National Emission Standards for Hazardous Air Pollutants (NESHAPS) Title 40, Part 61, Subpart M, Code of Federal Regulations.

3. U.S. Department of Transportation (DOT) including but not limited to:

1. Title 49, Part 172, Section 101 of the Code of Federal Regulations.

4. State of Missouri including but not limited to:

1. H.B. 77, 85th General Assembly.

2. Missouri Air Conservation Law Chapter 643.

3. Missouri Department of Natural Resources, Division 10, Chapter 6 of the Code of State Regulations as follows:

(1) 10 CSR 10-6.020, Definitions

(2) 10 CSR 10-6.080, Emission Standards for Hazardous Air Pollutants

(3) 10 CSR 10-6.230, Administrative Penalties

(4) Volume 18, Missouri Register, Page 44

(5) 10 CSR 10-6.250, Asbestos Abatement Projects - Certification, Accreditation, and Business Exemption Requirements

1.4 NOTIFICATIONS

1. Notifications meeting the requirements of Volume 18, Missouri Register, page 44, shall be completed and sent by the Contractor not less than ten (10) days before the intended starting date of the project. Send notification to the following:

1. Department of Natural Resources
Air Pollution Control Program (Asbestos)
P.O. Box 176
Jefferson City, Missouri 65102

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2. U.S. Environmental Protection Agency
Region VII
Air & Toxic Division, Air Branch
ATTN: Air Compliance
726 Minnesota Avenue
Kansas City, Kansas 66101

3. Provide a copy to the Owner's Representative. Five (5) day notification to the Owner's Representative is required on jobs less than the reportable quantity.

4. If the project is under the jurisdiction of the Kansas City Air Quality Section, St. Louis County Air Pollution Control Branch, or the Springfield-Green County Air Pollution Control Authority, send notification directly to the appropriate agency.

1.5 SUBMITTALS

1. The following will be submitted by contractor prior to commencement of work for approval by the Owner's Certified Industrial Hygienist (one copy for the Owner's Representative). Owner's C.I.H. will return reviewed copies to contractor and Owner's Representative.

1. One copy of safety data sheets (SDS) for products to be used by the Contractor in the performance of his work. Contractor will also maintain copies of SDS on site per OSHA.

2. One copy of the notifications to, or any correspondence with, the regulatory agencies. Submit a listing of all prior regulatory violations.

2. Friable Abatement:

1. Current Certificates of training and statement of qualifications for the project asbestos abatement supervisor and the Missouri Asbestos Occupational Certificates for all project personnel. List a summary of project personnel and contact phone numbers.

2. Name, address, and contact person's name of testing laboratory or laboratories to be utilized analyzing samples for bulk analysis or air samples.

3. Submit a detailed plan of the procedures proposed for use in complying with requirements of this specification and Volume 18, Missouri Register, page 44, and 29 CFR 1926.1101. Include in the plan the layout and location of barriers, decontamination units, route of ingress and egress for work area, methods used to assure safety of building occupants and visitors, methods used to isolate or closing out of HVAC system, personal air monitoring strategy, method of removal of material, and engineering controls utilized to prevent emissions from the work area.

4. Provide a disposal plan to detail type of disposal container, method of

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transportation to disposal site, waste hauler, and disposal site.

5. Copy of notifications required as part of the emergency notification plan.

3. Non-Friable Abatement:

1. Submit a detailed plan of the procedures proposed to minimize emissions and to prevent the material from becoming friable during removal.

2. Copy of emergency protection plan to be used if the nonfriable material should become friable during removal.

3. Current Certificates of training and statement of qualifications for the "Competent Person".

4. One copy of the Negative Initial Exposure Assessment.

5. Upon completion of the abatement work, the following information shall be submitted to the Owner's Representative.

1. Waste disposal receipts and waste shipment record on all asbestos waste removed from the project.

6. Upon completion of the abatement work, the following information shall be submitted by the Owner's C.I.H. to the Contractor.

1. Air sampling test results for personal (non-OSHA) and final clearance air samples taken under the supervision of Owner's Certified Industrial Hygienist. Results must be in writing in final report form.

2. Written certification from the Owner's Certified Industrial Hygienist.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 SUPERVISION OF ABATEMENT

1. The Contractor shall designate a competent supervisor subject to the approval of the Owner's C.I.H. and the Owner's Representative. The supervisor shall be the Contractor's representative on the project and shall meet the requirements of all applicable regulations and perform the following minimum requirements.

1. Be Certified by the State of Missouri as an Asbestos Abatement Supervisor, a minimum of one year prior full time experience in asbestos abatement work and a minimum of two years' experience as a supervisor, and be qualified as a Competent Person in accordance with OSHA regulation 1926.1101.

2. Be on site and supervise all abatement work in accordance with OSHA and

FRIABLE AND NON-FRIABLE ASBESTOS REMOVAL

Volume 18, Missouri Register, page 44.

3. Conduct all OSHA required air monitoring.
4. Maintain a daily log on the project documenting events, visitations, problems, equipment failures, accidents, and inspections.
5. Be responsible for implementation of first aid, safety training, respiratory protection, and ensuring all workers are trained in emergency procedures.
6. Be responsible for conducting a visual inspection of the work area prior to a visual inspection by the Owner's Certified Industrial Hygienist. Inspection shall be documented.

3.2 NEGATIVE INITIAL EXPOSURE ASSESSMENT

1. The Contractor must conduct a Negative Initial Exposure Assessment (non-friable asbestos) prior to removal of the asbestos material. The Negative Initial Exposure Assessment shall be performed by a "Competent Person" to determine whether the material may be removed and maintained in a nonfriable condition. If the material cannot be removed without becoming friable then the contractor shall comply to the requirements in this specification at no additional cost to the Owner.
2. The method of removal is the Contractor's option. However, in the event of any of the following:
 1. Visible emissions are observed
 2. Sanding, grinding, cutting, or abrading of the material
 3. Air samples exceed 0.1 f/cc

The contractor shall immediately stop work, implement corrective work practices, make any necessary notifications to all regulatory agencies of the changes in work practices and material conditions, and comply with the requirements as set forth in this specification.

3.3 WORKER PROTECTION & TRAINING

1. The Contractor shall be responsible for providing his employees with proper respiratory protection, respiratory training, written respirator program, medical examinations, maintaining medical records, and protective clothing and equipment to comply with OSHA requirements.
2. The Contractor shall be responsible for all testing and costs incurred for complying with requirements of OSHA regulations for Personal Air Sampling.
3. All workers shall be trained in the dangers inherent in handling asbestos and breathing asbestos dust and in proper work procedures and personal and protective

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measures.

4. All workers shall hold valid diplomas as accredited Asbestos Abatement Workers as required by 10 CSR 10-6.250.

3.4 INDEPENDENT TESTING LABORATORY

1. Testing Laboratories utilized by the Contractor for sample analysis during the project shall meet the following minimum requirements and be approved by the Owner's C.I.H. This information shall be submitted to the Owner's Representative for review.

1. All air monitoring samples shall be analyzed by a testing laboratory accredited by the American Industrial Hygiene Association (AIHA) or by an individual who is currently on the Asbestos Analyst Registry.

2. All bulk samples shall be analyzed by a testing laboratory accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

3.5 OWNER'S AIR SAMPLING PROFESSIONAL & CERTIFIED INDUSTRIAL HYGIENIST

1. It will be the Owner's responsibility to hire an Air Sampling Professional and/or Certified Industrial Hygienist. The Air Sampling Professional & Industrial Hygienist will also be required to perform/oversee the following duties as a minimum:

1. Approval of the Contractor's work plan and methods of abatement to meet regulatory requirements and ensure the health and safety of University faculty, staff, and students.

2. Verify that the contractor is satisfactorily performing personal air monitoring as directed by OSHA regulations.

3. Visual inspection of the work area and final clearance air monitoring.

4. Certify in writing that the Contractor's procedures, methods and practices were, to the best of my knowledge and belief, in compliance with current EPA, OSHA, State and/or applicable local regulations and that the work areas meet the requirements for final clearance testing and account of any known deviations.

5. Issue final air clearance certifications/notifications.

3.6 EMERGENCY PROTECTION PLAN

1. The contractor shall be responsible for developing a written Emergency Protection Plan and shall maintain this plan on site. The plan shall include considerations of asbestos leakage from the site, fire, explosion, toxic atmospheres, electrical hazards, slips, falls, and heat related injury. All employees shall be instructed and trained in the procedures.

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2. Emergency protection plan shall also include written notification of police, fire and medical personnel of the planned abatement activities, work schedule, and layout of work area, particularly barriers that may affect response capabilities.

3.7 LOCAL AREA PROTECTION & SITE SECURITY

1. The contractor shall be responsible for all areas of the building used by him and/or subcontractors in the performance of the work. Contractor shall exert full control over the actions of all employees and other persons with respect to the use and preservation of the existing building, except such controls as may be specifically reserved to the owner.

2. Contractor has the right to exclude from the work area all persons who have no purpose related to the work or its inspection, and shall require all persons in the work area to observe the same regulations required of Contractor's employees.

3. The contractor shall have control of site security during abatement operations in order to protect work environment and equipment. Contractor shall have the owner's assistance in notifying building occupants of impending activity and enforcement of restricted access by owner's employees.

4. The contractor shall keep a minimum of two 10 lbs. type ABC fire extinguishers on site. One shall be maintained outside the work area and one inside the work area. The employees shall be trained in the operation of extinguishers.

5. Where areas cannot be isolated by existing walls and doors from employees, students, or the public, barriers to each floor must be constructed of 1/2" plywood and 2"x4" framing 16" o.c. to isolate the area. The barriers must be installed in such a manner to prevent damage to existing walls, floors, or ceilings. Barrier may have a lockable door.

6. For the interior of the building during window removal activities, the abatement contractor shall construct a containment consisting of 6-mil polyethylene sheeting and sufficient framing, including a minimum of one (1) layer of polyethylene on the walls, floor and ceiling. A minimum of a one (1) chamber decontamination unit shall be attached to each containment. Depending upon the size of the containment, install a sufficient number of HEPA-filtered negative air machine(s) to establish a minimum of 4 air exchanges per hour. Based on coordination with the Owner and General Contractor, the containment can be installed around each window, around a group of windows, or around one whole side of the floor. The containment must be installed in such a manner to prevent damage to existing walls, floors, or ceilings.

6. The contractor shall maintain the work area free from rubbish, debris, and dirt and keep a clean, safe working area.

7. The Contractor shall provide warning signage around the regulated area as required by OSHA.

FRIABLE AND NON-FRIABLE ASBESTOS REMOVAL

8. The Contractor shall isolate any and all air supply and returns to the abatement space as required by OSHA. Contractor shall coordinate with the Owner's Representative.

9. The Contractor shall erect barrier tape and install polyethylene drop cloths on the ground on the exterior of the facility directly below where the windows are being removed. The barrier tape and polyethylene drop cloths shall extend, a minimum of ten feet, beyond the drop zone of any window debris.

9. The Contractor shall keep all areas where adhesive stripper is in use (such as mastic removal) under negative pressure and exhausted to the outside ambient air.

3.8 FINAL CLEARANCE REQUIREMENTS (FRIABLE ASBESTOS)

1. Upon completion of the abatement work, the supervisor shall perform a visual inspection of the work area. If satisfactory, the supervisor shall then request the Owner's C.I.H. or the C.I.H.'s air sampling technician to perform a visual inspection. When the Owner's C.I.H. feels the area is ready based on the results of their visual inspection, the Contractor may apply a lockdown encapsulant. Following application of lockdown encapsulant, the Owner's C.I.H. shall perform the final clearance sampling for airborne fiber concentrations.

2. The Owner's C.I.H. or designee will perform final clearance testing per the following requirements:

1. Aggressive sampling may be required for all areas where removal has taken place with the exception of glove bag projects where nonaggressive sampling is permitted.

2. P.C.M. samples analyzed on site shall be counted by an accredited registered microscopist.

3. For areas specifically specified for clearance by Transmission Electron Microscopy, the method shall be NIOSH 7402.

3. Any work areas failing to meet the clearance requirements of this section shall be recleaned and retested at the contractor's expense until satisfactory levels are obtained.

4. The Owner's C.I.H. shall provide a written report of the air monitoring activities to the contractor within 7 days after the final clearance testing.

5. Where the windows are being removed intact, with no disturbance to the asbestos, a visual inspection may be all that is needed.

6. Depending upon the method of removal, final clearance monitoring may not be warranted for this project.

3.9 REESTABLISHMENT OF THE WORK AREA AND SYSTEMS

SECTION 028233

FRIABLE AND NON-FRIABLE ASBESTOS REMOVAL

-
1. Reestablishment of the work area shall only occur after the contractor has received final clearance in writing from the Owner's C.I.H.
 2. All damage to finishes, equipment, and/or the area affected by the abatement shall be repaired by the contractor to equal or better condition as it was prior to the work, at no cost to the owner.

3.10 WASTE DISPOSAL

1. All asbestos-containing waste and/or asbestos contaminated debris shall, as a minimum, be double bagged in approved 6 mil. disposal bags or double-wrapped in 6 mil. polyethylene. Each bag/bundle shall be tagged to meet requirements of NESHAPS with an asbestos caution label and a source identification label.
2. Transportation shall meet the requirements of all regulatory agencies for asbestos-containing materials and shall be transported in an enclosed truck.
3. The waste disposal site shall be approved by the Missouri Department of Natural Resources for asbestos disposal. A chain of custody letter/waste shipment record and disposal receipts shall be provided to the owner for all materials disposed of.

3.11 DRAWINGS

Drawings, when provided, are not intended to be used for anything but a "reference" to the work area. Information is not specific to quantities or to exact location of ACM unless explicitly noted. Contractor will be required to field verify the conditions and quantities.

3.12 REPORTS

Reports, when provided, are intended to be used as a basis for the type and composition of the asbestos present for both bidding purposes and for the information required for the notifications to the governing agencies.

December 30, 2022

Ms. Heather Brown, Project Manager
Campus Facilities – Planning, Design & Construction
University of Missouri
130 General Services Building
Columbia, Missouri 65211

ATTN: Ms. Heather Brown
Email: brownheat@missouri.edu

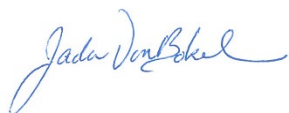
RE: **Report for Asbestos and Lead-Based Paint Survey**
Hill Hall Building Envelope Upgrades | MU Project Number CP220951
Hill Hall
506 S. 6th Street
Columbia, Missouri 65211
PSI Project Number: 0029-5621

Dear Ms. Brown:

In accordance with our agreement, Professional Service Industries, Inc., (PSI), an Intertek company, has conducted an Asbestos and Lead-Based Paint Survey of the windows and roofs planned for replacement at the Hill Hall Building. Please find one (1) electronic (.pdf format) copy of the report for these services enclosed.

We appreciate the opportunity to provide our services to you on this project and would be pleased to continue our role as your environmental consultant. If we can be of further assistance to you, please feel free to contact us.

Respectfully submitted,
PROFESSIONAL SERVICE INDUSTRIES, INC.

A handwritten signature in blue ink that reads "Jada VonBokel".

Jada VonBokel
IH/Environmental Services

A handwritten signature in blue ink that reads "Greg Chambliss".

Greg Chambliss, RPIH, LEED AP
Department Manager

Enclosures



ASBESTOS AND LEAD-BASED PAINT SURVEY REPORT

For

HILL HALL BUILDING WINDOW & ROOF REPLACEMENT

MU PROJECT NUMBER: CP220951

University of Missouri
Columbia, Missouri 65211

Prepared for

Campus Facilities
University of Missouri
130 General Services Building
Columbia, Missouri 65211

Prepared by

Professional Service Industries, Inc.
11826 Borman Drive
St. Louis, Missouri 63146
Telephone 314-432-8073

PSI PROJECT NUMBER: 0029-5621

December 30, 2022



A handwritten signature in blue ink, reading "Jada VonBokel".

Jada VonBokel
MDNR Asbestos Inspector
Cert. No.: 7118121721MOIR17791

A handwritten signature in blue ink, reading "Kevin C. Roberts".

Kevin C. Roberts
MDNR Asbestos Inspector
Cert. No.: 7118121721MOIR12746
MDHSS Lead Inspector
Lic. No.: 080128-300001836

A handwritten signature in blue ink, reading "Greg Chambliss".

Greg Chambliss, RPIH, LEED AP
Department Manager



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1.0 INTRODUCTION

1.1 GENERAL INFORMATION

Professional Service Industries, Inc. (PSI), an Intertek company, was retained by the University of Missouri, Columbia to conduct an Asbestos and Lead-Based Paint Survey for the planned Hill Hall Building window and roof replacement project – MU Project Number CP220951.

The survey area consisted of the windows at the north, south, and east elevations of all floors of Hill Hall. The west elevation is connected to the Gannett Hall; therefore, it was not included in the survey area.

This report has been prepared for the exclusive use of the University of Missouri.

1.2 AUTHORIZATION

Authorization to perform the assessment was given by Ms. Heather Brown of the University of Missouri via Work Authorization #22 of PSI's Blanket Agreement Project CP211181 for Project Number CP220951.

PSI was escorted throughout the survey areas by University of Missouri maintenance personnel.

1.3 PURPOSE

The purpose of the survey was to determine the presence/absence of asbestos and lead-based paint prior to the planned window replacement.



2.0 SCOPE OF SERVICES

2.1 SCOPE OF WORK

As part of this project, the following services were performed:

- Asbestos Survey and Sampling
- Lead-Based Paint Testing

2.2 SAMPLING GUIDELINES

The survey of representative windows of the Hill Hall Building was conducted in general accordance with the Environmental Protection Agency (EPA) Asbestos Hazard Emergency Response Act (AHERA) and the National Emission Standards for Hazardous Air Pollutants (NESHAP) sampling guidelines to determine the presence of exposed and/or physically accessible suspect ACM, identify the location of ACM or assumed ACM, and quantify the amount of ACM identified during the inspection. Each suspect material was touched, where possible, to determine the friability of the material.

A visual inspection and sampling survey of the planned replacement of windows and roof was conducted in accordance with general EPA/AHERA sampling guidelines to determine the presence of suspect asbestos-containing materials (ACM). Mr. Kevin Roberts and Ms. Jada VonBokel, State of Missouri, and EPA accredited asbestos inspectors, performed the asbestos survey.

Samples of suspect asbestos-containing materials were collected from representative elevations of all floors of the facility.

Bulk samples were sent to PSI's laboratory located in Pittsburgh, Pennsylvania, for analysis. Each sample underwent Polarized Light Microscopy (PLM) analysis for detection of asbestos fibers in the building materials. The current EPA Method for the Determination of Asbestos in Bulk Building Materials is in document EPA-600/R-93/116 July 1993. The results of the analyses are summarized in Section 4.0 of this report. Suspect materials identified, but not sampled are also summarized. The laboratory report and chain-of-custody for these analyses are presented in Appendix A.

Mr. Kevin Roberts, a State of Missouri licensed Lead Inspector, used an Olympus DPD-6500-CC X-Ray Fluorescence (XRF) Paint Analyzer to determine the presence and amount of lead in the painted components of the windows that might be potentially disturbed as part of the planned window replacement.



3.0 METHODOLOGY

3.1 GENERAL REFERENCES

Asbestos sampling and assessment procedures were performed in general accordance with the guidelines published by the EPA in 40 CFR Part 763 Subpart E, October 30, 1987, and NESHAP regulation (40 CFR Part 61, April 6, 1973, revised 1990).

3.2 VISUAL INSPECTION

The visual inspection for asbestos was performed by EPA and State of Missouri accredited inspectors. An initial walkthrough was conducted to determine the presence and condition of suspect materials, which were accessible and/or exposed. Materials, which were similar in general appearance, were grouped into homogeneous sampling areas. In addition, the friability of the suspect material was determined. A material is defined as friable (F) if the material can be reduced to a powder by hand pressure when dry. Non-Friable (NF) materials that are damaged can also be considered friable.

3.2.1 Homogeneous Material Classifications

A preliminary walkthrough of survey areas was conducted to determine areas of materials, which were visually similar in color, texture, general appearance, and which appeared to have been installed at the same time. Such materials are termed "homogeneous materials" by the EPA. During the walkthrough, the approximate locations of these homogeneous materials were also noted.

Following the EPA inspection protocol, each identified suspect asbestos homogeneous material was placed in one of the following EPA classifications:

- **Surfacing Materials** (spray or trowel applied to building members)
- **Thermal System Insulation** (materials generally applied to various mechanical systems)
- **Miscellaneous Materials** (any materials which do not fit either of the above categories)

3.3 SAMPLING PROCEDURES

Following the walkthrough, the inspectors collected selected samples of suspect asbestos-containing materials. Sampling was limited to those materials physically accessible to the inspectors during the time of the inspection, except if the structural integrity of the item being tested would be compromised.

EPA guidelines were used to determine the sampling protocol. Sampling locations were chosen to be representative of the homogeneous material.

Samples of suspect miscellaneous asbestos materials were taken as randomly as possible while again attempting to sample already damaged areas so as to minimize disturbance of the material.



A State of Missouri licensed Lead Inspector used an Olympus Model DPD-6500-CC X-Ray Fluorescence (XRF) Paint Analyzer to determine the presence and amount of lead in painted components in the building that might be potentially disturbed during the planned renovations.

Testing was performed so that there was a minimum of one (1) test for a maximum of approximately 200 square feet of a particular painted component. PSI believes that each representative material and component in the survey areas was addressed.

This limited sampling scope of work is not intended to meet the strict requirements of the U.S. Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), the U.S. Department of Housing and Urban Development (HUD), or State regulatory requirements, except for licensing (if applicable).

PSI was escorted throughout the survey areas by University of Missouri maintenance personnel.

Although PSI made an attempt to identify all areas of ACM, an exhaustive investigation of void spaces was not included in the scope of services for this project. There may exist conditions which were unable to be identified within the scope of this study.

3.4 QUANTIFICATION

Quantities of accessible and/or exposed building materials, which were confirmed or assumed to contain asbestos, were estimated. This estimation was performed by taking approximate measurements in the field.

Quantities are estimates and should be confirmed prior to putting out to bid for abatement.

3.5 LABORATORY PROCEDURES

3.5.1 Method of Analysis

Asbestos analysis was performed by using the bulk sample for visual observation and slide preparation(s) for microscopic examination and identification. The samples were mounted on slides and then analyzed for asbestos (chrysotile, amosite, crocidolite, anthophyllite, and actinolite/tremolite) and non-asbestos fibrous constituents (mineral wool, paper, etc.). Asbestos was identified by refractive indices, morphology, color, pleochroism, birefringence, extinction characteristics, and signs of elongation. The same characteristics were used to identify the non-asbestos constituents.

The microscopist visually estimated relative amounts of each constituent by determining the volume of each constituent in proportion to the total volume of the sample, using a stereoscope.

3.5.2 Laboratory Quality Control Program

PSI's laboratory maintains an in-house quality control program. This program involves blind reanalysis of ten percent of samples, precision, and accuracy controls, and use of standard bulk reference materials for asbestos.



4.0 FINDINGS AND RECOMMENDATIONS

4.1 ASBESTOS SURVEY SUMMARY

Asbestos-Containing Materials

A material is considered by the EPA and/or State of Missouri to be asbestos containing if at least one sample collected from the homogenous area contains asbestos in an amount greater than 1%. A material is defined as friable (F) if the material can be reduced to a powder by hand pressure when dry. Non-Friable (NF) materials that are damaged can also be considered friable. The following table includes the results.

Sample Numbers	Description	General Location	Asbestos, % and type	F/NF	Condition	Estimated Quantity
HH-PL3-A-1, 2, 3	Plaster	North, South, East Elevations of 3 rd Floor	ND, ND, ND	NF	Good	NA
HH-WG3-B-1, 2, 3	Window Glazing, cream	Windows of North, South, East Elevations of 3rd Floor	2% CH, NT, NT	F	Good to Fair	See Note2 Below
HH-WC3-C-1, 2, 3	Window Caulk, cream	Windows of North, South, East Elevations of 3rd Floor	6% CH, NT, NT	F	Good to Fair	See Note2 Below
HH-MRT-D-1, 2, 3	Mortar, stone	Exterior Stone under windows on N., S., E. Elevations of 3 rd Floor	ND, ND, ND	NF	Good	NA
HH-PL2-E-1, 2, 3	Plaster	East, West, South Elevations of 2 nd Floor	ND, ND, ND	NF	Good	NA
HH-WG2-F-1, 2, 3	Window Glazing, white & cream	Windows of East, West, South Elevations of 2nd Floor	ND, 2% CH, NT	F	Good to Fair	See Note2 Below
HH-WC2-G-1, 2, 3	Window Caulk, cream	Windows of East, West, South Elevations of 2nd Floor	6% CH, NT, NT	F	Good to Fair	See Note2 Below
HH-PL1-H-1, 2, 3	Plaster	North, South, West Elevations of 1 st Floor	ND, ND, ND	NF	Good	NA
HH-WG1-I-1, 2, 3	Window Glazing, white	Windows of North, South, West Elevations of 1 st Floor	ND, ND, ND	F	Good to Fair	NA
HH-WC1-J-1, 2, 3	Window Caulk, white	Window of North, South, West Elevations of 1st Floor	2% CH, NT, NT	F	Good to Fair	See Note2 Below
HH-PL0-K-1, 2, 3	Plaster	West, East, North Elevations of Ground Floor	ND, ND, ND	NF	Good	NA
HH-WG0-L-1, 2, 3	Window Glazing, white	Windows of West, East, North Elevations of Ground Floor	ND, ND, ND	F	Good to Fair	NA
HH-WC0-M-1, 2, 3	Window Caulk	Windows of West, East, North Elevations of Ground Floor	7% CH, NT, NT	F	Good to Fair	See Note2 Below
HH-ROF-N-1, 2, 3	Roofing Material	Flat Upper Perimeter Roof	ND, ND, ND	NF	Good	NA
HH-ROF-O-1, 2, 3	Roofing Material	Slate Roof	ND, ND, ND	NF	Good	NA
HH-ROF-P-1, 2, 3	Roofing Material	Flat Lower Roof	ND, ND, ND	NF	Good	NA

Materials found to be asbestos-containing are **bolded** and *italicized*.

ND = No Asbestos Detected NA = Not Applicable NT = Not Analyzed Due To 1st Positive

CH = Chrysotile asbestos AM = Amosite asbestos

SF = Square Feet LF = Linear Feet EA = Each TBD = To Be Determined

F – Friable NF = Non-Friable



Note1: PSI noted that the window caulk and glazing was a combination of older and newer caulk/glazing installed at different times.

Note2: Because the glazing and/or caulking were found to be asbestos-containing at all elevations and floors, the totals for the windows have been combined to include all windows for the entirety of the building. These totals are: North Elevation = approximately 32 Windows; South Elevation = approximately 29 Windows; West Elevation = approximately 52 Windows; and East Elevation = approximately 47 Windows for a total of approximately 160 windows.

Based on the sample results, the window glazing was found to contain 2% Chrysotile asbestos. The window caulk was found to contain between 2% Chrysotile asbestos and 7% Chrysotile asbestos. There are approximately 160 window openings for the entirety of the building.

If these materials have a likelihood of being disturbed, they should be removed by a State of Missouri licensed asbestos abatement contractor prior to the planned window replacement.

Please refer to Appendix A for a more detailed description of the microscopic analysis of these samples. PSI personnel and laboratory accreditations are included as Appendix C.

Lead-Based Paint

A material is considered lead-based paint by the EPA, HUD, and the State of Missouri if it is found to contain more than 1.0 mg/cm² lead by XRF analysis.

A summary of the XRF data is as follows:

3rd Floor – Exterior Wood Windowsill (yellow cream) and Exterior Wood Window Frame (yellow cream);

2nd Floor – Exterior Wood Windowsill (yellow cream), Exterior Wood Window Frame (yellow cream), and Exterior Wood Window Jamb (yellow cream); and

1st Floor – Interior Wood Window (light brown stain), Exterior Wood Window Frame (yellow cream), Interior Wood Window Muntin (dark gray, light brown), Interior Wood Window (light brown), and Wood Windowsill (yellow cream).

Ground Floor – Interior Wood Window Muntin (light brown, dark brown), Exterior Wood Window Frame (yellow cream), Interior Wood Window (light brown),

Based on the XRF data collected during the survey, painted wood window frames, windowsills, windows, muntins, and jambs are considered lead-based paint. Appendix B contains the XRF Data Testing Table.

4.2 ADDITIONAL CONSIDERATIONS

If other materials are discovered during renovation activities (i.e., behind walls, in ceilings) that were not addressed in this report and/or previously sampled, PSI recommends that these materials be sampled to determine the presence or absence of asbestos or assume the material to be asbestos and have it removed by a State of Missouri licensed asbestos abatement contractor.



5.0 WARRANTY

Professional Service Industries, Inc. warrants that the findings contained herein have been prepared in general accordance with accepted professional practices as applied by similar professionals in the community at the time of its preparation. Changes in the state of the art or in applicable regulations cannot be anticipated and have not been addressed in this report.

The field and laboratory results reported herein are considered sufficient in detail and scope to determine the presence, condition, and hazard potential of accessible and/or exposed suspect asbestos-containing or lead-based paint materials in the property at the time of survey. Test results are valid only for the material tested.

There is a distinct possibility that conditions may exist which could not be identified within the scope of study, or which were not apparent during the site visit. This survey covered only those areas, which were exposed and/or physically accessible to the inspector. The study is also limited to the information available from the client at the time it was conducted.

PSI warrants that the findings contained herein have been prepared with the level of care and skill ordinarily exercised by professionals practicing in the community. The scope of work addressed readily accessible and exposed interior and exterior building areas. Observation or sampling of inaccessible areas such as behind walls or within ductwork was performed on a limited basis.

The University of Missouri acknowledges that mold is ubiquitous to the environment with mold amplification occurring when building materials are impacted by moisture. The client further acknowledges that site conditions are outside of PSI's control, and that mold amplification will likely occur, or continue to occur, in the presence of moisture. As such, PSI cannot and shall not be held responsible for the occurrence or reoccurrence of mold amplification.

No other warranties are implied or expressed.



APPENDIX A

ASBESTOS LABORATORY RESULTS AND CHAIN OF CUSTODY FORMS



REPORT OF BULK SAMPLE ANALYSIS FOR ASBESTOS

TESTED FOR: PSI, Inc
11826 Borman Drive
St. Louis, MO 63146
Attn: Greg Chambliss

Project ID: 0029-5621
Hill Hall
506 S. 6th Street, Columbia, MO 65211
Prefix: HH-

Date Received: 11/21/2022

Date Completed: 11/29/2022

Date Reported: 11/29/2022

Analyst: Chris Kopar Work Order: 2211444 Page: 1 of 4

Client ID	Lab ID (Layer)	Sample Description (Color, Texture, Etc.) <i>Analyst's Comment</i>	Asbestos Content (Percent and Type)	Non-asbestos Fibers (Percent and Type)
PL3-A-1	001A	(1) White, Plaster, Homogeneous	NO ASBESTOS DETECTED	None Reported
PL3-A-2	002A	(1) White, Plaster, Homogeneous (2) Beige, Plaster, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
PL3-A-3	003A	(1) White, Plaster, Homogeneous (2) Beige, Plaster, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
WG3-B-1	004A	(1) Cream, Glazing, Homogeneous	2% Chrysotile	None Reported
WG3-B-2	005A	Sample Not Tested		
WG3-B-3	006A	Sample Not Tested		
WC3-C-1	007A	(1) Cream, Caulking, Homogeneous	6% Chrysotile	9% Polyethylene
WC3-C-2	008A	Sample Not Tested		
WC3-C-3	009A	Sample Not Tested		
MRT-D-1	010A	(1) Gray, Mortar, Homogeneous (2) White, Mortar, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MRT-D-2	011A	(1) Gray, Mortar, Homogeneous (2) White, Mortar, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MRT-D-3	012A	(1) Gray, Mortar, Homogeneous (2) White, Mortar, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported

Quantitation is based on a visual estimation of the relative area of bulk sample components, unless otherwise noted in the "Comments" section of this report. The results are valid only for the item tested as received. This report may not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. Method used: E.P.A. Interim Method for the Determination of Asbestos in Bulk Insulation Samples (EPA 600/M4-82-020). Polarized Light Microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Quantitative Transmission Electron Microscopy is currently the only method that can be used to determine if the material can be considered or treated as non-asbestos containing. Samples will be disposed of within 30 days unless notified in writing by the client. No part of this report may be reproduced, except in full, without written permission of the laboratory. The reporting limit is 1% by weight. NVLAP Lab Code 101350-0.

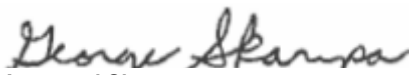
Respectfully submitted,
PSI, Inc.


Approved Signatory
George Skarupa

Client ID	Lab ID (Layer)	Sample Description (Color, Texture, Etc.) <i>Analyst's Comment</i>	Asbestos Content (Percent and Type)	Non-asbestos Fibers (Percent and Type)
PL2-E-1	013A	(1) White, Plaster, Homogeneous	NO ASBESTOS DETECTED	None Reported
PL2-E-2	014A	(1) White, Plaster, Homogeneous (2) Gray, Plaster, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
PL2-E-3	015A	(1) White, Drywall, Homogeneous (2) White, Joint Compound, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	25% Cellulose Fiber None Reported
WG2-F-1	016A	(1) White, Glazing, Homogeneous	NO ASBESTOS DETECTED	None Reported
WG2-F-2	017A	(1) Cream, Glazing, Homogeneous	2% Chrysotile	None Reported
WG2-F-3	018A	Sample Not Tested		
WC2-G-1	019A	(1) Cream, Caulking, Homogeneous	6% Chrysotile	9% Polyethylene
WC2-G-2	020A	Sample Not Tested		
WC2-G-3	021A	Sample Not Tested		
PL1-H-1	022A	(1) White, Plaster, Homogeneous	NO ASBESTOS DETECTED	None Reported
PL1-H-2	023A	(1) White, Plaster, Homogeneous (2) Beige, Plaster, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
PL1-H-3	024A	(1) White, Plaster, Homogeneous (2) Beige, Plaster, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
WG1-I-1	025A	(1) White, Glazing, Homogeneous	NO ASBESTOS DETECTED	None Reported
WG1-I-2	026A	(1) White, Glazing, Homogeneous	NO ASBESTOS DETECTED	None Reported
WG1-I-3	027A	(1) White, Glazing, Homogeneous	NO ASBESTOS DETECTED	None Reported
WC1-J-1	028A	(1) White, Caulking, Homogeneous	2% Chrysotile	3% Polyethylene
WC1-J-2	029A	Sample Not Tested		
WC1-J-3	030A	Sample Not Tested		

Quantitation is based on a visual estimation of the relative area of bulk sample components, unless otherwise noted in the "Comments" section of this report. The results are valid only for the item tested as received. This report may not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. Method used: E.P.A. Interim Method for the Determination of Asbestos in Bulk Insulation Samples (EPA 600/M4-82-020). Polarized Light Microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Quantitative Transmission Electron Microscopy is currently the only method that can be used to determine if the material can be considered or treated as non-asbestos containing. Samples will be disposed of within 30 days unless notified in writing by the client. No part of this report may be reproduced, except in full, without written permission of the laboratory. The reporting limit is 1% by weight. NVLAP Lab Code 101350-0.

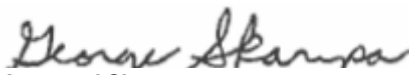
Respectfully submitted,
PSI, Inc.


Approved Signatory
George Skarupa

Client ID	Lab ID (Layer)	Sample Description (Color, Texture, Etc.) <i>Analyst's Comment</i>	Asbestos Content (Percent and Type)	Non-asbestos Fibers (Percent and Type)
PL0-K-1	031A	(1) White, Plaster, Homogeneous (2) Beige, Plaster, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
PL0-K-2	032A	(1) White, Plaster, Homogeneous	NO ASBESTOS DETECTED	None Reported
PL0-K-3	033A	(1) White, Plaster, Homogeneous (2) Beige, Plaster, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
WG0-L-1	034A	(1) White, Glazing, Homogeneous	NO ASBESTOS DETECTED	None Reported
WG0-L-2	035A	(1) White, Glazing, Homogeneous	NO ASBESTOS DETECTED	None Reported
WG0-L-3	036A	(1) White, Glazing, Homogeneous	NO ASBESTOS DETECTED	None Reported
WC0-M-1	037A	(1) White, Caulking, Homogeneous	7% Chrysotile	None Reported
WC0-M-2	038A	Sample Not Tested		
WC0-M-3	039A	Sample Not Tested		
ROF-N-1	040A	(1) White, Drywall, Homogeneous (2) Yellow, Foam, Homogeneous (3) Black, Paper, Homogeneous (4) Black, Roofing, Homogeneous <i>Rubber</i>	NO ASBESTOS DETECTED NO ASBESTOS DETECTED NO ASBESTOS DETECTED NO ASBESTOS DETECTED	20% Cellulose Fiber None Reported 20% Fibrous Glass None Reported
ROF-N-2	041A	(1) White, Drywall, Homogeneous (2) Yellow, Foam, Homogeneous (3) Black, Paper, Homogeneous (4) Black, Roofing, Homogeneous <i>Rubber</i>	NO ASBESTOS DETECTED NO ASBESTOS DETECTED NO ASBESTOS DETECTED NO ASBESTOS DETECTED	20% Cellulose Fiber None Reported 15% Fibrous Glass 60% Cellulose Fiber None Reported
ROF-N-3	042A	(1) White, Drywall, Homogeneous (2) Yellow, Foam, Homogeneous (3) Black, Paper, Homogeneous (4) Black, Roofing, Homogeneous <i>Rubber</i>	NO ASBESTOS DETECTED NO ASBESTOS DETECTED NO ASBESTOS DETECTED NO ASBESTOS DETECTED	20% Cellulose Fiber None Reported 15% Fibrous Glass 60% Cellulose Fiber None Reported

Quantitation is based on a visual estimation of the relative area of bulk sample components, unless otherwise noted in the "Comments" section of this report. The results are valid only for the item tested as received. This report may not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. Method used: E.P.A. Interim Method for the Determination of Asbestos in Bulk Insulation Samples (EPA 600/M4-82-020). Polarized Light Microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Quantitative Transmission Electron Microscopy is currently the only method that can be used to determine if the material can be considered or treated as non-asbestos containing. Samples will be disposed of within 30 days unless notified in writing by the client. No part of this report may be reproduced, except in full, without written permission of the laboratory. The reporting limit is 1% by weight. NVLAP Lab Code 101350-0.

Respectfully submitted,
PSI, Inc.

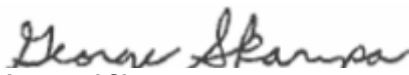

Approved Signatory
George Skarupa

Client ID	Lab ID (Layer)	Sample Description (Color, Texture, Etc.) <i>Analyst's Comment</i>	Asbestos Content (Percent and Type)	Non-asbestos Fibers (Percent and Type)
ROF-O-1	043A	(1) Black, Roofing, Homogeneous <i>Slate</i>	NO ASBESTOS DETECTED	None Reported
		(2) Black, Tar Paper, Homogeneous	NO ASBESTOS DETECTED	60% Cellulose Fiber
ROF-O-2	044A	(1) Black, Roofing, Homogeneous <i>Slate</i>	NO ASBESTOS DETECTED	None Reported
		(2) Black, Tar Paper, Homogeneous	NO ASBESTOS DETECTED	60% Cellulose Fiber
ROF-O-3	045A	(1) Black, Roofing, Homogeneous <i>Slate</i>	NO ASBESTOS DETECTED	None Reported
		(2) Black, Tar Paper, Homogeneous	NO ASBESTOS DETECTED	60% Cellulose Fiber
ROF-P-1	046A	(1) White, Insulation, Homogeneous	NO ASBESTOS DETECTED	None Reported
		(2) Yellow, Foam, Homogeneous	NO ASBESTOS DETECTED	None Reported
		(3) Black, Roofing, Homogeneous	NO ASBESTOS DETECTED	25% Cellulose Fiber
		(4) Black, Roofing, Homogeneous <i>Rubber</i>	NO ASBESTOS DETECTED	None Reported
ROF-P-2	047A	(1) White, Insulation, Homogeneous	NO ASBESTOS DETECTED	None Reported
		(2) Yellow, Foam, Homogeneous	NO ASBESTOS DETECTED	None Reported
		(3) Black, Roofing, Homogeneous	NO ASBESTOS DETECTED	50% Cellulose Fiber
		(4) Black, Roofing, Homogeneous <i>Rubber</i>	NO ASBESTOS DETECTED	None Reported
		(5) White, Plaster, Homogeneous	NO ASBESTOS DETECTED	2% Cellulose Fiber
ROF-P-3	048A	(1) White, Insulation, Homogeneous	NO ASBESTOS DETECTED	None Reported
		(2) Yellow, Foam, Homogeneous	NO ASBESTOS DETECTED	None Reported
		(3) Black, Roofing, Homogeneous	NO ASBESTOS DETECTED	5% Fibrous Glass 10% Cellulose Fiber
		(4) Black, Roofing, Homogeneous <i>Rubber</i>	NO ASBESTOS DETECTED	None Reported

Report Notes: (PT) Point Count Results

Quantitation is based on a visual estimation of the relative area of bulk sample components, unless otherwise noted in the "Comments" section of this report. The results are valid only for the item tested as received. This report may not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. Method used: E.P.A. Interim Method for the Determination of Asbestos in Bulk Insulation Samples (EPA 600/M4-82-020). Polarized Light Microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Quantitative Transmission Electron Microscopy is currently the only method that can be used to determine if the material can be considered or treated as non-asbestos containing. Samples will be disposed of within 30 days unless notified in writing by the client. No part of this report may be reproduced, except in full, without written permission of the laboratory. The reporting limit is 1% by weight. NVLAP Lab Code 101350-0.

Respectfully submitted,
PSI, Inc.


Approved Signatory
George Skarupa

CHAIN OF CUSTODY - ASB/LEAD/IH

2211444 (3)



IH Laboratory
850 Poplar Street
Pittsburgh, PA 15220
412-922-4000

Project Information	
Project No:	0029-5621
Project Name:	Hill Hall
Project Address:	506 S. 6th Street, Columbia, MO 65211
Sample Date:	11/17/2022

Send Results To:	
Company:	PSI
Attn:	Greg Chambliss
Address:	11826 Borman Drive, St. Louis, Missouri 63146
Telephone:	314-432-8073
Email:	greg.chambliss@intertek.com

Send Invoice To:	
Company:	PSI
Attn:	Greg Chambliss
Address:	11826 Borman Drive, St. Louis, Missouri 63146
Telephone:	314-432-8073
Email:	greg.chambliss@intertek.com

Requested Turnaround Time:		
Same Day	1-2 Day	3-5 Day
☐	☐	☒
Requested Date:		11/28/2022

Stop at First Positive	
Y	N
☒	☐

Laboratory Use Only	
All Samples In Acceptable Condition: ☐ Y ☐ N	
Comments:	
Shipping Charges Apply: ☐	

Parameter													
Sample ID:	Number of Samples	PLM Bulk	Point Count (400)	Point Count (1000)	Lead Wipe	Lead Air	Lead Soil	Lead Paint Chip	Lead TCLP	PCM	PCM "B Rules"	TEM AHERA	TEM 7402
HH-PL3-A-1, 2, 3	3	X											
HH-WG3-B-1, 2, 3	3	X											
HH-WC3-C-1, 2, 3	3	X											
HH-MRT-D-1, 2, 3	3	X											
HH-PL2-E-1, 2, 3	3	X											
HH-WG2-F-1, 2, 3	3	X											
HH-WC2-G-1, 2, 3	3	X											
Description:													
												plaster	Total Chromium
												plaster	Zinc
												plaster	Cadmium
												plaster	Respirable Dust
												plaster	Total Nuisance Dust
												plaster	NY SOF-V
												plaster	NY TEM NOB
												plaster	NY PLM Friable/NOB
												plaster	TEM Wipe
												plaster	TEM Vacuum
												plaster	TEM Chatfield
												plaster	TEM 7402
												plaster	TEM AHERA
												plaster	PCM
												plaster	Lead TCLP
												plaster	Lead Paint Chip
												plaster	Lead Soil
												plaster	Lead Air
												plaster	Lead Wipe
												plaster	Point Count (1000)
												plaster	Point Count (400)
												plaster	PLM Bulk
												plaster	Number of Samples

Relinquished by	Date/Time	Received by	Date/Time
Jada VonBokel	11/18/22 9am	Schulz	11/21/2022
Analyst Name:		Analyst Signature:	

Special Instructions / Comments:
page 1 of 3

CHAIN OF CUSTODY - ASB/LEAD/IH

2211444



IH Laboratory
850 Poplar Street
Pittsburgh, PA 15220
412-922-4000

Project Information	
Project No:	0029-5621
Project Name:	Hill Hall
Project Address:	506 S. 6th Street, Columbia, MO 65211
Sample Date:	11/17/2022

Send Results To:	
Company:	PSI
Attn:	Greg Chambliss
Address:	11826 Borman Drive, St. Louis, Missouri 63146
Telephone:	314-432-8073
Email:	greg.chambliss@intertek.com

Send Invoice To:	
Company:	PSI
Attn:	Greg Chambliss
Address:	11826 Borman Drive, St. Louis, Missouri 63146
Telephone:	314-432-8073
Email:	greg.chambliss@intertek.com

Requested Turnaround Time:		
Same Day	1-2 Day	3-5 Day
☐	☐	☒
Requested Date:		11/28/2022

Stop at First Positive	
Y	N
☒	☐

Laboratory Use Only	
All Samples In Acceptable Condition:	Y ☐ N ☐
Comments:	
Shipping Charges Apply:	☐

Parameter													
Sample ID:	Number of Samples	PLM Bulk	Point Count (400)	Point Count (1000)	Lead Wipe	Lead Air	Lead Soil	Lead Paint Chip	Lead TCLP	PCM	PCM "B Rules"	TEM AHERA	TEM 7402
HH-PL1-H-1, 2, 3	3	X											
HH-WG1-H-1, 2, 3	3	X											
HH-WC1-J-1, 2, 3	3	X											
HH-PL0-K-1, 2, 3	3	X											
HH-WG0-L-1, 2, 3	3	X											
HH-WC0-M-1, 2, 3	3	X											
HH-ROF-N-1, 2, 3	3	X											
Description:													
													plaster
													window glazing
													window caulk
													plaster
													window glazing
													window caulk
													roofing - upper partimeter

Relinquished by	Date/Time	Received by	Date/Time
Jada VonBokel	11/18/22 9am	SW	11/21/22
Analyst Name:		Analyst Signature:	

Special Instructions / Comments:	page 2 of 3
----------------------------------	-------------

2211444

**IH Laboratory
850 Poplar Street
Pittsburgh, PA 15220
412-922-4000**

Project Information	
Project No:	0029-5621
Project Name:	Hill Hall
Project Address:	506 S. 6th Street, Columbia, MO 65211
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Telephone:	314-432-8073
Email:	greg.chambliss@intertek.com

Send Invoice To:	
Company:	PSI
Attn:	Greg Chambliss
Address:	11826 Borman Drive; St. Louis, Missouri 63146
Telephone:	314-432-8073
Email:	greg.chambliss@intertek.com

Requested Turnaround Time:			
Same Day	1-2 Day	3-5 Day	Requested Date:
☐	☐	☒	11/28/2022

Stop at First Positive	N	☐
	Y	☒

Laboratory Use Only		Y	N
All Samples In Acceptable Condition:		☐	☐
Comments:			
Shipping Charges Apply:		☐	☐

[illegible]

Relinquished by	Date/Time	Received by	Date/Time
Jada VonBokel	11/18/22 9am	SW	11/24/2022
<i>[Signature]</i>			9/

Analyst Name:	Analyst Signature:



APPENDIX B

XRF DATA TESTING TABLE

PSI Project #:

0029-5621

XRF Device #:

DPD-6500-CC

Date of Survey:

11/17/22

Building:

Hill Hall - 506 S. 6th St.
Columbia, MO 65211

Type of XRF:

Olympus

Operator's Name:

Kevin Roberts

XRF Testing Data Table

Shot No.	Interior / Exterior	Room #	Wall	Component	Substrate	Paint Color	Paint Condition	XRF Reading	Result
1	Calibration								Pass
2									
3									
4	Interior	309	North	Window Frame	Wood	Brown Stain	Good	0.65	Negative
5	Interior	309	North	Windowsill	Wood	Brown Stain	Good	0.01	Negative
6	Interior	309	North	Window	Wood	Brown Stain	Good	0.43	Negative
7	Interior	309	North	Wall	Plaster	Yellow	Good	0.00	Negative
8	Exterior	--	North	Windowsill	Wood	Yellow Cream	Good	1.76	Positive
9	Exterior	--	North	Window Jamb	Wood	Yellow Cream	Good	0.11	Negative
10	Exterior	309	North	Window Frame	Wood	Yellow Cream	Good	5.00	Positive
11	Interior	309	East	Window Frame	Wood	Brown Stain	Good	0.67	Negative
12	Interior	309	East	Windowsill	Wood	Brown	Good	0.03	Negative
13	Interior	309	East	Window Muntin	Wood	Brown	Good	0.31	Negative
14	Interior	309	East	Wall	Plaster	Yellow	Good	0.00	Negative
15	Exterior	--	East	Windowsill	Wood	Yellow Cream	Good	1.29	Positive
16	Exterior	--	East	Window Frame	Wood	Yellow Cream	Good	5.00	Positive
17	Interior	302	South	Window Frame	Wood	Brown Stain	Good	0.45	Negative
18	Interior	302	South	Windowsill	Wood	Brown Stain	Good	0.08	Negative
19	Interior	302	South	Window	Wood	Brown Stain	Good	0.03	Negative
20	Interior	302	South	Wall	Plaster	Cream	Good	0.00	Negative
21	Exterior	302	South	Window Jamb	Wood	Yellow Cream	Good	0.11	Negative
22	Exterior	302	South	Window Frame	Wood	Yellow Cream	Good	0.24	Negative

XRF Testing Data Table

Shot No.	Interior / Exterior	Room #	Wall	Component	Substrate	Paint Color	Paint Condition	XRF Reading	Result
23	Exterior	302	South	Window Frame	Wood	Yellow Cream	Good	1.67	Positive
24	Interior	201	East	Window Frame	Wood	Brown Stain	Good	0.11	Negative
25	Interior	201	East	Window Frame	Wood	Brown Stain	Good	0.03	Negative
26	Interior	201	East	Window Muntin	Wood	Brown	Good	0.32	Negative
27	Exterior	201	East	Windowsill	Wood	Yellow Cream	Good	0.00	Negative
28	Exterior	201	East	Window Frame	Wood	Yellow Cream	Good	5.00	Positive
29	Interior	201	East	Wall	Plaster	Cream	Good	0.00	Negative
30	Interior	201	South	Window Frame	Wood	Brown Stain	Good	0.51	Negative
31	Interior	201	South	Windowsill	Wood	Brown Stain	Good	0.05	Negative
32	Interior	201	South	Window	Wood	Brown Stain	Good	0.01	Negative
33	Interior	201	South	Wall	Plaster	Cream	Good	0.00	Negative
34	Exterior	201	East	Window Jamb	Wood	Yellow Cream	Good	0.06	Negative
35	Exterior	201	East	Window Frame	Wood	Yellow Cream	Good	5.00	Positive
36	Interior	206	West	Window Frame	Wood	Lt. Brown Stain	Good	0.06	Negative
37	Interior	206	West	Windowsill	Wood	Lt. Brown Stain	Good	0.00	Negative
38	Interior	206	West	Window Muntin	Wood	Lt. Brown Stain	Good	0.03	Negative
39	Interior	206	West	Wall	Plaster	Gray	Good	0.00	Negative
40	Exterior	206	West	Window Jamb	Wood	Yellow Cream	Good	5.00	Positive
41	Exterior	206	West	Window Frame	Wood	Yellow Cream	Good	5.00	Positive
42	Interior	101A	South	Window Frame	Wood	Lt. Brown Stain	Good	0.29	Negative
43	Interior	101A	South	Windowsill	Wood	Dark Brown	Good	0.10	Negative
44	Interior	101A	South	Window	Wood	Lt. Brown Stain	Good	1.69	Positive
45	Interior	101A	South	Wall	Plaster	Light Gray	Good	0.00	Negative
46	Exterior	101B	South	Windowsill	Wood	Yellow Cream	Good	0.04	Negative

XRF Testing Data Table

Shot No.	Interior / Exterior	Room #	Wall	Component	Substrate	Paint Color	Paint Condition	XRF Reading	Result
47	Exterior	101B	South	Window Frame	Wood	Yellow Cream	Good	5.00	Positive
48	Interior	118F	West	Window Frame	Wood	Dark Gray	Good	0.37	Negative
49	Interior	118F	West	Windowsill	Wood	Dark Gray	Good	0.09	Negative
50	Interior	118F	West	Window Muntin	Wood	Dark Gray	Good	3.10	Positive
51	Interior	118F	West	Wall	Plaster	Gray	Good	0.00	Negative
52	Exterior	118F	West	Window Jamb	Wood	Yellow Cream	Good	0.04	Negative
53	Exterior	118F	West	Window Frame	Wood	Yellow Cream	Good	5.00	Positive
54	Interior	111	North	Window Frame	Wood	Light Brown	Good	0.56	Negative
55	Interior	111	North	Windowsill	Wood	Light Brown	Good	0.02	Negative
56	Interior	111	North	Window	Wood	Light Brown	Good	1.78	Positive
57	Exterior	111	North	Windowsill	Wood	Yellow Cream	Good	1.67	Positive
58	Exterior	111	North	Window Frame	Wood	Yellow Cream	Good	5.00	Positive
59	Interior	4A	West	Window Frame	Wood	Light Brown	Good	0.12	Negative
60	Interior	4A	West	Windowsill	Wood	Light Brown	Good	0.07	Negative
61	Interior	4A	West	Window Muntin	Wood	Light Brown	Good	3.01	Positive
62	Interior	4A	West	Wall	Plaster	Cream	Good	0.00	Negative
63	Exterior	4A	West	Window Jamb	Wood	Yellow Cream	Good	0.07	Negative
64	Exterior	4A	West	Window Frame	Wood	Yellow Cream	Good	5.00	Positive
65	Interior	13B	North	Window Frame	Wood	Light Brown	Good	0.56	Negative
66	Interior	13B	North	Windowsill	Wood	Light Brown	Good	0.06	Negative
67	Interior	13B	North	Window	Wood	Light Brown	Good	1.70	Positive
68	Exterior	13B	North	Windowsill	Wood	Yellow Cream	Good	0.70	Negative
69	Exterior	13B	North	Window Frame	Wood	Yellow Cream	Good	1.67	Positive
70	Interior	13B	North	Wall	Plaster	Cream	Good	0.00	Negative

XRF Testing Data Table

Shot No.	Interior / Exterior	Room #	Wall	Component	Substrate	Paint Color	Paint Condition	XRF Reading	Result	
71	Interior	9B	East	Window Frame	Wood	Dark Brown	Good	0.54	Negative	
72	Interior	9B	East	Windowsill	Wood	Dark Brown	Good	0.08	Negative	
73	Interior	9B	East	Window Muntin	Wood	Dark Brown	Good	2.37	Positive	
74	Interior	9B	East	Wall	Plaster	Cream	Good	0.00	Negative	
75	Exterior	9B	East	Window Jamb	Wood	Yellow Cream	Good	0.01	Negative	
76	Exterior	9B	East	Window Frame	Wood	Yellow Cream	Good	5.00	Positive	
77	Calibration								1.90	Pass
78									1.78	
79									1.68	



APPENDIX C

PERSONNEL/LABORATORY ACCREDITATIONS



Missouri Department of Health and Senior Services

P.O. Box 570, Jefferson City, MO 65102-0570 Phone: 573-751-6400 FAX: 573-751-6010
RELAY MISSOURI for Hearing and Speech Impaired and Voice dial: 711

Donald G. Kauerauf
Director



Michael L. Parson
Governor

February 1, 2022

Kevin Roberts
Intertek-PSI
11826 Borman Drive
St. Louis, MO 63146

Dear Mr. Roberts:

The Missouri Department of Health and Senior Services' Lead Licensing Program has approved your renewal application for a Lead Inspector license.

Enclosed is your Lead Inspector license certificate and photo identification badge. If you intend to perform any regulated lead-bearing substance activities, you must be employed by a licensed Missouri lead abatement contractor. Please have your identification badge with you at all times while conducting lead abatement activities.

Note the date your Lead Inspector license expires. A renewal notice will be mailed to you approximately four months prior to your license expiration date, and your renewal application will need to be completed and submitted to the Program 60 days prior to the expiration date.

A requirement of renewing your application will be attending a Lead Inspector refresher class. A list of Missouri accredited lead abatement training providers will be included with your renewal notice. For additional information, forms, and training requirements, please visit our website <http://health.mo.gov/safety/leadlicensing/index.php>.

Please contact the Lead Licensing Program by phone at (573) 526-5873, toll-free at (888) 837-0927, or by email at lead@health.mo.gov if you have any questions concerning this letter or lead abatement regulations in general.

Sincerely,

A handwritten signature in blue ink that reads "Angie DeBroeck". The signature is written in a cursive, flowing style.

Angie DeBroeck
Lead Licensing Program

AKD:tp

Enclosures

www.health.mo.gov

Healthy Missourians for life.

The Missouri Department of Health and Senior Services will be the leader in promoting, protecting and partnering for health.

AN EQUAL OPPORTUNITY / AFFIRMATIVE ACTION EMPLOYER: Services provided on a nondiscriminatory basis.

STATE OF MISSOURI
DEPARTMENT OF HEALTH AND SENIOR SERVICES

LEAD OCCUPATION LICENSE REGISTRATION

Issued to:

Kevin C. Roberts

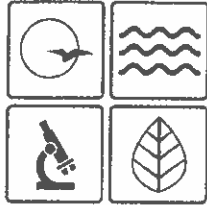
The person, firm or corporation whose name appears on this certificate has fulfilled the requirements for licensure as set forth in the Missouri Revised Statutes 701.300-701.338, as long as not suspended or revoked, and is hereby authorized to engage in the activity listed below.

Lead Inspector
Category of License

Issuance Date: **1/28/2022**
Expiration Date: **1/28/2024**
License Number: **080128-300001836**



Donald G. Kauerauf
Director
Department of Health and Senior Services



Missouri Department of NATURAL RESOURCES

dnr.mo.gov

Michael L. Parson, Governor

December 23, 2021

Kevin C Roberts
824 Grant Park Court
Wentzville, MO 63385

CERTIFICATION NUMBER:
7118121721MOIR12746

THIS CERTIFIES
Kevin C Roberts
HAS COMPLETED THE CERTIFICATION
REQUIREMENTS FOR
Inspector



APPROVED: **12/23/2021**
EXPIRES: **12/23/2022**

TRAINING DATE: **12/17/2021**


Director of Air Pollution Control Program

RE: Missouri Asbestos Occupation Certification Card

Enclosed is your certification card for Asbestos Inspector, as issued by the Asbestos Unit of the Missouri Department of Natural Resources' Air Pollution Control Program.

Missouri Certification Number: 7118121721MOIR12746
Course Training Date: December 17, 2021
Missouri Certification Approval Date: December 23, 2021
Missouri Certification Expiration Date: December 23, 2022

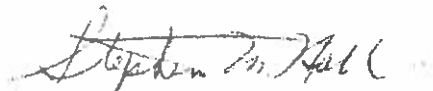
Note:

- All Missouri-certified asbestos personnel must comply with the following statutes and regulations:
 - Sections 643.225 to 643.250, RSMo;
 - 10 CSR 10-6.241 *Asbestos Projects-Registration, Abatement, Notification, Inspection, Demolition, and Performance Requirements*; and
 - 10 CSR 10-6.250 *Asbestos Projects-Certification, Accreditation and Business Exemption Requirements*.
- To keep your occupation certification up-to-date, you must complete an annual refresher course and submit a renewal application each year.
- In order to be eligible to renew your certification, you must successfully complete a refresher course with a Missouri-accredited training provider within 12 months of the expiration date of your current training certificate. If you exceed this grace period, you will be required to retake a Missouri-accredited initial course in order to be eligible for Missouri certification.

To obtain a copy of the certification renewal application, or review regulations and requirements, please visit our website at <http://dnr.mo.gov/env/apcp/asbestos/index.htm>.

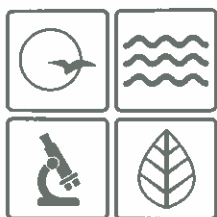
If you have any questions please call the Air Pollution Control Program at 573-751-4817.

AIR POLLUTION CONTROL PROGRAM



Director of Air Pollution Control Program





Missouri Department of NATURAL RESOURCES

dnr.mo.gov

Michael L. Parson, Governor

December 23, 2021

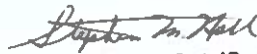
Jada C VonBokel
11826 Borman Dr.
St. Louis, MO 63146

CERTIFICATION NUMBER:
7118121721MOIR17791

THIS CERTIFIES
Jada C VonBokel
HAS COMPLETED THE CERTIFICATION
REQUIREMENTS FOR
Inspector



APPROVED: **12/23/2021**
EXPIRES: **12/23/2022**

TRAINING DATE: **12/17/2021**

Director of Air Pollution Control Program

RE: **Missouri Asbestos Occupation Certification Card**

Enclosed is your certification card for Asbestos Inspector, as issued by the Asbestos Unit of the Missouri Department of Natural Resources' Air Pollution Control Program.

Missouri Certification Number: 7118121721MOIR17791
Course Training Date: December 17, 2021
Missouri Certification Approval Date: December 23, 2021
Missouri Certification Expiration Date: December 23, 2022

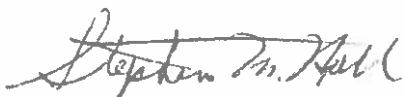
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- To keep your occupation certification up-to-date, you must complete an annual refresher course and submit a renewal application each year.
- In order to be eligible to renew your certification, you must successfully complete a refresher course with a Missouri-accredited training provider within 12 months of the expiration date of your current training certificate. If you exceed this grace period, you will be required to retake a Missouri-accredited initial course in order to be eligible for Missouri certification.

To obtain a copy of the certification renewal application, or review regulations and requirements, please visit our website at <http://dnr.mo.gov/env/apcp/asbestos/index.htm>.

If you have any questions please call the Air Pollution Control Program at 573-751-4817.

AIR POLLUTION CONTROL PROGRAM



Director of Air Pollution Control Program



United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 101350-0

Intertek-PSI, Inc.

Pittsburgh, PA

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*

Asbestos Fiber Analysis

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communiqué dated January 2009).*

2022-07-01 through 2023-06-30

Effective Dates



A handwritten signature in blue ink, reading "Peter S. Lander".

For the National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

Intertek-PSI, Inc.
PSI, Inc.
850 Poplar Street
Pittsburgh, PA 15220
Ms. Catherine McNamee
Phone: 412-922-4010 x286 Fax: 412-922-4014
Email: cathy.mcnamee@intertek.com
<http://www.intertek.com>

ASBESTOS FIBER ANALYSIS

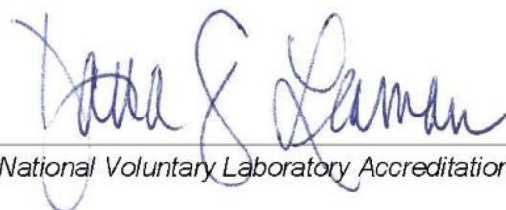
NVLAP LAB CODE 101350-0

Bulk Asbestos Analysis

<u>Code</u>	<u>Description</u>
18/A01	EPA -- 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples
18/A03	EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Airborne Asbestos Analysis

<u>Code</u>	<u>Description</u>
18/A02	U.S. EPA's "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Nonmandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR, Part 763, Subpart E, Appendix A.



For the National Voluntary Laboratory Accreditation Program

September 30, 2023

Ms. Heather Brown - Project Manager
Planning, Design & Construction
University of Missouri
130 General Services Building
Columbia, Missouri 65211

ATTN: Ms. Heather Brown
Email: brownheat@missouri.edu

RE: **Report for Limited Hazardous Materials Survey**
Project Number CP222891
Hill Hall HVAC Upgrades
506 South 6TH Street
Columbia, Missouri 65211
PSI Project Number: 0029-5992

Dear Ms. Brown:

In accordance with our agreement, Professional Service Industries, Inc., (PSI), an Intertek company, has conducted a Hazardous Materials Survey of client specified areas of the MU Hill Hall Facility in preparation of the planned HVAC upgrades. Please find one (1) electronic (.pdf format) copy of the report for these services enclosed.

We appreciate the opportunity to provide our services to you on this project and would be pleased to continue our role as your environmental consultant. If we can be of further assistance to you, please feel free to contact us.

Respectfully submitted,
PROFESSIONAL SERVICE INDUSTRIES, INC.

A handwritten signature in blue ink that reads "Brenden James Helbig".

Brenden Helbig
IH/Environmental Services

A handwritten signature in blue ink that reads "Greg Chambliss".

Greg Chambliss, RPIH, LEED AP
Department Manager

Enclosures



HAZARDOUS MATERIALS SURVEY REPORT

For

HILL HALL HVAC UPGRADES
MU PROJECT NUMBER: CP222891
HILL HALL
506 S. 6TH Street
COLUMBIA, MISSOURI 65211

Prepared for

Campus Facilities
University of Missouri
130 General Services Building
Columbia, Missouri 65211

Prepared by

Professional Service Industries, Inc.
11826 Borman Drive
St. Louis, Missouri 63146
Telephone 314-432-8073

PSI PROJECT NUMBER: 0029-5992

September 30, 2023



A handwritten signature in blue ink that reads "Matthew Basch".

Matthew Basch
MDHSS Lead Inspector
Lic. No.: 220330-300006255

A handwritten signature in blue ink that reads "Megan Kienker".

Megan Kienker
MDNR Asbestos Inspector
Cert. No.: 7136052623MOIR21662

A handwritten signature in blue ink that reads "Greg Chambliss".

Greg Chambliss, RPIH, LEED AP
Department Manager



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1.0 INTRODUCTION

1.1 GENERAL INFORMATION

Professional Service Industries, Inc. (PSI), an Intertek company, was retained by the University of Missouri, Columbia to conduct a Hazardous Materials Survey for the areas at the Hill Hall Facility that will be impacted by the HVAC upgrades for the Hill Hall HVAC Upgrades Project – MU Project Number CP222891.

The survey area consisted of the attic space, corridors on all floors, stairwells on all floors, and one small closet to be converted into a pipe chase on all floors. Drawings of these areas were provided to PSI via an email.

This report has been prepared for the exclusive use of the University of Missouri.

1.2 AUTHORIZATION

Authorization to perform the assessment was given by Ms. Beth Asbury of the University of Missouri via Work Authorization #1 to PSI's Blanket Agreement Project #CP246011 for Project #CP222891, dated June 12, 2023.

PSI was provided access to the survey areas by University of Missouri maintenance personnel.

1.3 PURPOSE

The purpose of the survey was to determine the presence of asbestos, lead-based paint, and universal waste materials prior to the planned west building addition.



2.0 SCOPE OF SERVICES

2.1 SCOPE OF WORK

As part of this project, the following services were performed:

- Asbestos Survey and Sampling
- Lead-Based Paint Testing
- Evaluation for the presence of the following environmental concerns included but was *not limited to*:
 - Fluorescent Light Tubes
 - PCB-Containing Light Ballasts
 - Exit Signs
 - Fire Extinguishers

2.2 SAMPLING GUIDELINES

The survey of the areas to be impacted for the Hill Hall HVAC Upgrades was conducted in general accordance with the Environmental Protection Agency (EPA) Asbestos Hazard Emergency Response Act (AHERA) and the National Emission Standards for Hazardous Air Pollutants (NESHAP) sampling guidelines to determine the presence of exposed and/or physically accessible suspect ACM, identify the location of ACM or assumed ACM, and quantify the amount of ACM identified during the inspection. Each suspect material was touched, where possible, to determine the friability of the material.

A visual inspection and sampling survey of the planned building addition connection areas was conducted in accordance with general EPA/AHERA sampling guidelines to determine the presence of suspect asbestos-containing materials (ACM). Ms. Megan Kienker and Mr. Matthew Basch, State of Missouri, and EPA accredited asbestos inspectors, performed the asbestos survey. Samples of suspected asbestos-containing materials were collected from representative areas of the facility, which could be physically entered during the survey.

Bulk samples were sent to PSI's laboratory located in Pittsburgh, Pennsylvania, for analysis. Each sample underwent Polarized Light Microscopy (PLM) analysis for detection of asbestos fibers in the building materials. The current EPA Method for the Determination of Asbestos in Bulk Building Materials is in document EPA-600/R-93/116 July 1993. The results of the analyses are summarized in Section 4.0 of this report. Suspect materials identified, but not sampled are also summarized. The laboratory report and chain-of-custody for these analyses are presented in Appendix A.

Mr. Matthew Basch, a State of Missouri licensed Lead Inspector, used a Viken Pb200e X-Ray Fluorescence (XRF) Paint Analyzer to determine the presence and amount of lead in painted components in the surveyed portions of the building that might be potentially disturbed as part of the planned building addition.

As part of this survey, PSI did not sample, but noted the presence of the other above-listed environmental concerns.



3.0 METHODOLOGY

3.1 GENERAL REFERENCES

Asbestos sampling and assessment procedures were performed in general accordance with the guidelines published by the EPA in 40 CFR Part 763 Subpart E, October 30, 1987, and NESHAP regulation (40 CFR Part 61, April 6, 1973, revised 1990).

3.2 VISUAL INSPECTION

The visual inspection for asbestos was performed by EPA and State of Missouri accredited inspectors. An initial walkthrough was conducted to determine the presence and condition of suspect materials, which were accessible and/or exposed. Materials, which were similar in general appearance, were grouped into homogeneous sampling areas. In addition, the friability of the suspect material was determined. A material is defined as friable (F) if the material can be reduced to a powder by hand pressure when dry. Non-Friable (NF) materials that are damaged can also be considered friable.

3.2.1 Homogeneous Material Classifications

A preliminary walkthrough of survey areas was conducted to determine areas of materials, which were visually similar in color, texture, general appearance, and which appeared to have been installed at the same time. Such materials are termed "homogeneous materials" by the EPA. During the walkthrough, the approximate locations of these homogeneous materials were also noted.

Following the EPA inspection protocol, each identified suspect asbestos homogeneous material was placed in one of the following EPA classifications:

- **Surfacing Materials** (spray or trowel applied to building members)
- **Thermal System Insulation** (materials generally applied to various mechanical systems)
- **Miscellaneous Materials** (any materials which do not fit either of the above categories)

3.3 SAMPLING PROCEDURES

Following the walkthrough, the inspectors collected selected samples of suspect asbestos-containing materials. Sampling was limited to those materials physically accessible to the inspector during the time of the inspection, except if the structural integrity of the item being tested would be compromised.

EPA guidelines were used to determine the sampling protocol. Sampling locations were chosen to be representative of the homogeneous material.

Samples of suspect miscellaneous asbestos materials were taken as randomly as possible while again attempting to sample already damaged areas so as to minimize disturbance of the material.



Although PSI made an attempt to identify all areas of ACM, an exhaustive investigation of void spaces was not included in the scope of services for this project. There may exist conditions which were unable to be identified within the scope of this study.

A State of Missouri licensed Lead Inspector used a Viken Pb200e X-Ray Fluorescence (XRF) Paint Analyzer to determine the presence and amount of lead in painted components in the basement of the building that might be potentially disturbed during the planned renovations.

Testing was performed so that there was a minimum of one (1) test for a maximum of approximately 500 square feet of a particular painted component. PSI believes that each representative material and component in the survey areas was addressed.

3.4 QUANTIFICATION

Quantities of accessible and/or exposed building materials, which were confirmed or assumed to contain asbestos, were estimated. This estimation was performed by taking approximate measurements in the field.

Quantities are estimates and should be confirmed prior to being put out to bid for abatement.

3.5 LABORATORY PROCEDURES

3.5.1 Method of Analysis

Asbestos analysis was performed by using the bulk sample for visual observation and slide preparation(s) for microscopic examination and identification. The samples were mounted on slides and then analyzed for asbestos (chrysotile, amosite, crocidolite, anthophyllite, and actinolite/tremolite) and non-asbestos fibrous constituents (mineral wool, paper, etc.). Asbestos was identified by refractive indices, morphology, color, pleochroism, birefringence, extinction characteristics, and signs of elongation. The same characteristics were used to identify the non-asbestos constituents.

The microscopist visually estimated relative amounts of each constituent by determining the volume of each constituent in proportion to the total volume of the sample, using a stereoscope.

3.5.2 Laboratory Quality Control Program

PSI's laboratory maintains an in-house quality control program. This program involves blind reanalysis of ten percent of samples, precision, and accuracy controls, and use of standard bulk reference materials for asbestos.



4.0 FINDINGS AND RECOMMENDATIONS

4.1 ASBESTOS SURVEY SUMMARY

Asbestos-Containing Materials

A material is considered by the EPA and/or State of Missouri to be asbestos containing if at least one sample collected from the homogenous area contains asbestos in an amount greater than 1%. A material is defined as friable (F) if the material can be reduced to a powder by hand pressure when dry. Non-Friable (NF) materials that are damaged can also be considered friable. The following table includes the results.

Sample Numbers	Description	General Location	Asbestos, % and type	F/NF	Condition	Estimated Quantity
PI-A-01, 02, 03	(1) Pipe Fitting, White (2) Pipe and Pipe Fitting Insulation, White	Attic, Ground Floor Hall (Above Ceiling), Mechanical Room	(1) ND, ND, ND (2) 10% CH, 10% CH, 10% CH	F	Good	600 LF in Attic 200 LF in Ground Floor Hall 160 LF in Mech. Room
VC-B-01, 02, 03	Vibration Cloth (Black)	Attic	ND, ND, ND	NF	Good	NA
CT-C-01, 02, 03	2' X 2' Ceiling Tile	Hallways Ground Floor 1 st , 2 nd , 3 rd	ND, ND, ND	F	Good	NA
FT-D-01, 02, 03	(1) 12" x 12" Floor Tile, White (2) Mastic, Black	Janitors Closet 3rd Floor	(1) 2% CH, 2% CH, 2% CH (2) ND, ND, ND	NF	Good	25 SF
FT-E-01, 02, 03	12" x 12" Black Floor Tile (In Pattern with Red Floor Tile) (1) Mastic, Transparent (2) Floor Tile, Black (3) Mastic, Black	1st, 2nd, 3rd & Ground Floor (Under Carpet)	(1) ND, ND, ND (2) 2% CH, 2% CH, 2% CH (3) ND, ND, ND	NF	Good	5,600 SF
FT-F-01, 02, 03	12" x 12" Red Floor Tile (In Pattern with Black Floor Tile) (1) Mastic, Transparent (2) Floor Tile, Red (3) Mastic, Black	1st, 2nd, 3rd & Ground Floor (Under Carpet)	(1) ND, ND, ND (2) 2% CH, 2% CH, 2% CH (3) ND, ND, ND	NF	Good	Included in Quantity Listed Above for Samples E-01 thru E-03
PL-G-01, 02, 03	Plaster Walls	Ground, 2 nd and 3 rd Floor Halls	ND, ND, ND	NF	Good	NA
CT-H-01, 02, 03	1' X 1' Ceiling Tile	1 st and 2 nd Floor Halls, 3 rd Floor Hall (Above Drop Ceiling)	ND, ND, ND	F	Good	NA
MP-I-01, 02, 03	Ceiling Tile Adhesive - Mastic Pucks (Brown)	1 st and 2 nd Floor Halls, 3 rd Floor Hall (Above Drop Ceiling)	ND, ND, ND	NF	Good	NA
DW-J-01, 02, 03	(1) Drywall (2) Joint Compound	1 st Floor Hall (Throughout), 2 nd Floor Hall	(1) ND, ND, ND (2) ND, ND, ND	NF	Good	NA
FT-K-01, 02, 03	12" x 12" Floor Tile (Multi Layered) (1) Black Floor Tile (2) Black Mastic (3) Red and Brown Floor Tile (4) Black Mastic	2nd Floor Janitor's Closet	(1) ND, ND, ND (2) ND, ND, ND (3) 2% CH, 2% CH, 2% CH (4) ND, ND, ND	NF	Good	25 SF



Sample Numbers	Description	General Location	Asbestos, % and type	F/NF	Condition	Estimated Quantity
FT-L-01, 02, 03	(1) 12" x 12" Gray Floor Tile (2) Mastic, Black	1 st Floor Janitor's Closet	(1) ND, ND, ND (2) ND, ND, ND	NF	Good	NA
FT-M-01, 02, 03	(1) 12" x 12" Red Floor Tile (2) Mastic, Black	Ground Floor Janitor's Closet	(1) 2% CH, NT, NT (2) 3% CH, NT, NT	NF	Good	25 SF
FT-N-01, 02, 03	(1) 12" X 6" Black Floor Tile (2) Yellow Mastic	Border of North Annex Entry (Vestibule)	(1) ND, ND, ND (2) ND, ND, ND	NF	Good	NA
FT-O-01, 02, 03	(1) 12" X 12" Gray Floor Tile (2) Yellow Mastic	North Annex Entry (Vestibule)	(1) ND, ND, ND (2) ND, ND, ND	NF	Good	NA

Materials found to be asbestos-containing are **bolded** and *italicized*.

ND = No Asbestos Detected NA = Not Applicable NT = Not Analyzed Due To 1st Positive

CH = Chrysotile asbestos AM = Amosite asbestos

SF = Square Feet LF = Linear Feet EA = Each TBD = To Be Determined

F – Friable NF = Non-Friable *Material to be analyzed by the Point Count Method

Based on the sample results, the following materials were found to contain asbestos:

- Pipe and Pipe Fitting Insulation - Attic, Ground Floor Hall (Above Ceiling), and Mechanical Room – Approximately 960 LF;
- 12"x12" White Floor Tile - 3rd Floor Janitor's Closet – Approximately 25 SF;
- 12"x12" Black Floor Tile and Red Floor Tile (Bottom Layer) – 3rd Floor Hall, 2nd Floor Hall, 1st Floor Hall, and Ground Floor Hall Under Carpet – Approximately 5,600 SF;
- 12"x12" Red and Brown Floor Tile (Bottom Layer) – 2nd Floor Janitor's Closet – Approximately 25 SF; and
- 12"x12" Red Floor Tile – Ground Floor Janitor's Closet – Approximately 25 SF.

Based on the sample results, the following materials were found to NOT contain asbestos:

- Duct Vibration Cloth – Attic;
- 2'x2' Lay-in Ceiling Tile – 3rd Floor Hall, 2nd Floor Hall, and 1st Floor Hall, and Ground Floor Hall;
- Plaster Walls - 3rd Floor Hall, 2nd Floor Hall, and 1st Floor Hall, and Ground Floor Hall;
- 1'x1' Ceiling Tile – 3rd Floor Hall Above Drop Ceiling, 2nd Floor Hall, and 1st Floor Hall;
- Ceiling Tile Adhesive (Mastic Pucks) - 3rd Floor Hall Above Drop Ceiling, 2nd Floor Hall, and 1st Floor Hall;
- Drywall and Joint Compound – 2nd Floor Hall, and 1st Floor Hall;
- 12"x12" Gray Floor Tile – 1st Floor Janitor's Closet;
- Black Border Tile – North Annex Entry; and
- 12"x12" Floor Tile and Mastic – North Annex Entry

Lead-Based Paint

A material is considered lead-based paint by the EPA, HUD, and the State of Missouri if it is found to contain more than 1.0 mg/cm² lead by XRF analysis.



The following tested components within the surveyed areas were identified as containing LBP:

- Metal Railing in South Stairwell – Brown
- Metal Railing in North Stairwell – Brown
- Mechanical Room Door – Gray
- North Annex Entry – Door Frame – Off-White

4.2 UNIVERSAL WASTES SURVEY SUMMARY

The following universal wastes were identified during the survey.

Fluorescent Light Tubes

Approximately 126 fluorescent light tubes were noted in the survey area. Fluorescent light tubes may contain small amounts of Mercury and should be disposed of properly.

PCB-Containing Light Ballasts

Approximately 78 light ballasts were noted in the survey area. Polychlorinated biphenyl (PCB) is a known carcinogenic material. Its use was discontinued January 1, 1979. Due to the age of the building, it should be assumed that these ballasts contain PCBs. Due to this, PCB light ballasts should be disposed of with a licensed waste hauler and should be properly incinerated. Ballasts need to be transported in a labeled steel drum containing some type of absorbent material, to absorb and leaking PDB oil.

Smoke Detectors

Approximately 21 smoke detectors were noted in the survey area. Smoke detectors may contain small amounts of radioactive material and should be disposed of properly.

Fire Alarms

Approximately 11 fire alarms were noted in the survey area. These fire alarms may contain small amounts of radioactive material and should be disposed of properly.

Door Closures

Approximately 8 door closures were noted in the survey area. These door closures may contain hazardous components that should be disposed of properly.

Thermostats

Approximately 1 thermostat was noted in the survey area. These thermostats may contain small amounts of mercury and should be disposed of properly.

Emergency Lights

Approximately 8 emergency lights were noted in the survey area. These emergency lights may contain small amounts of lead in the batteries and should be disposed of properly.



Exit Signs

Approximately 7 exit signs were noted in the survey area. These exit signs may contain small amounts of lead in the batteries and should be disposed of properly.

Tritium Exit Signs

Approximately 2 Tritium exit signs were noted in the 3rd Floor Corridor of this building. Tritium exit signs must be properly packaged, labeled, and transferred to a manufacturer, distributor, licensed radioactive waste broker or licensed low level radioactive waste disposal facility.

Water Coolers

Approximately 7 water coolers were noted in the survey area. Water coolers may contain small amounts of lead in the reservoir and/or Chlorofluorocarbons (CFCs) and/or Hydrochlorofluorocarbons (HCFCs) and should be disposed of properly.

Fire Extinguishers

Approximately 10 fire extinguishers were noted in the survey areas. Fire extinguishers may contain amounts of CFCs and/or HCFCs and should be disposed of properly.

Bottles- Cleaning/Oil/Etc.

Approximately 2 bottles of solvents were noted in the survey area. Solvents may contain various amounts and types of volatile chemicals and should be disposed of properly.

4.3 ADDITIONAL CONSIDERATIONS

If other materials are discovered during renovation activities (i.e., behind walls, in ceilings) that were not addressed in this report and/or previously sampled, PSI recommends that these materials be sampled to determine the presence or absence of asbestos or assume the material to be asbestos and have it removed by a State of Missouri licensed asbestos abatement contractor.



5.0 WARRANTY

Professional Service Industries, Inc. warrants that the findings contained herein have been prepared in general accordance with accepted professional practices as applied by similar professionals in the community at the time of its preparation. Changes in the state of the art or in applicable regulations cannot be anticipated and have not been addressed in this report.

The field and laboratory results reported herein are considered sufficient in detail and scope to determine the presence, condition, and hazard potential of accessible and/or exposed suspect asbestos-containing or lead-based paint materials in the property at the time of survey. Test results are valid only for the material tested.

There is a distinct possibility that conditions may exist which could not be identified within the scope of study, or which were not apparent during the site visit. This survey covered only those areas which were exposed and/or physically accessible to the inspector. The study is also limited to the information available from the client at the time it was conducted.

PSI warrants that the findings contained herein have been prepared with the level of care and skill ordinarily exercised by professionals practicing in the community. The scope of work addressed readily accessible and exposed interior and exterior building areas. Observation or sampling of inaccessible areas such as behind walls or within ductwork was performed on a limited basis.

The University of Missouri acknowledges that mold is ubiquitous to the environment with mold amplification occurring when building materials are impacted by moisture. The client further acknowledges that site conditions are outside of PSI's control, and that mold amplification will likely occur, or continue to occur, in the presence of moisture. As such, PSI cannot and shall not be held responsible for the occurrence or reoccurrence of mold amplification.

No other warranties are implied or expressed.



APPENDIX A

ASBESTOS LABORATORY RESULTS AND CHAIN OF CUSTODY FORMS

REPORT OF BULK SAMPLE ANALYSIS FOR ASBESTOS

TESTED FOR: PSI, Inc
 11826 Borman Drive
 St. Louis, MO 63146
 Attn: Greg Chambliss

Project ID: 0029-5992
 Univ. of MO - Hill Hall
 506 South 6th Street
 Columbia, MO 65201; Prefix: Hill-

Date Received: 8/28/2023

Date Completed: 9/5/2023

Date Reported: 9/5/2023

Analyst: Lori Huss

Work Order: 2308522

Page: 1 of 4

Client ID	Lab ID (Layer)	Sample Description (Color, Texture, Etc.) <i>Analyst's Comment</i>	Asbestos Content (Percent and Type)	Non-asbestos Fibers (Percent and Type)
PI-A-01	001A	(1) White, Fitting, Homogeneous (2) White, Pipe Insulation, Homogeneous	NO ASBESTOS DETECTED 10% Chrysotile	100% Cellulose Fiber None Reported
PI-A-02	002A	(1) White, Fitting, Homogeneous (2) White, Pipe Insulation, Homogeneous	NO ASBESTOS DETECTED 10% Chrysotile	100% Cellulose Fiber None Reported
PI-A-03	003A	(1) White, Fitting, Homogeneous (2) White, Pipe Insulation, Homogeneous	NO ASBESTOS DETECTED 10% Chrysotile	100% Cellulose Fiber None Reported
VC-B-01	004A	(1) Black, Other, Homogeneous <i>Vibration Cloth</i>	NO ASBESTOS DETECTED	100% Cellulose Fiber
VC-B-02	005A	(1) Black, Other, Homogeneous <i>Vibration Cloth</i>	NO ASBESTOS DETECTED	100% Cellulose Fiber
VC-B-03	006A	(1) Black, Other, Homogeneous <i>Vibration Cloth</i>	NO ASBESTOS DETECTED	100% Cellulose Fiber
CT-C-01	007A	(1) White, Ceiling Tile, Homogeneous	NO ASBESTOS DETECTED	85% Fibrous Glass
CT-C-02	008A	(1) White, Ceiling Tile, Homogeneous	NO ASBESTOS DETECTED	85% Fibrous Glass
CT-C-03	009A	(1) White, Ceiling Tile, Homogeneous	NO ASBESTOS DETECTED	85% Fibrous Glass
FT-D-01	010A	(1) White, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous <i>Inseparable Black and Yellow Mastic</i>	2% Chrysotile NO ASBESTOS DETECTED	None Reported None Reported

Quantitation is based on a visual estimation of the relative area of bulk sample components, unless otherwise noted in the "Comments" section of this report. The results are valid only for the item tested as received. This report may not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. Method used: E.P.A. Interim Method for the Determination of Asbestos in Bulk Insulation Samples (EPA 600/M4-82-020). Polarized Light Microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Quantitative Transmission Electron Microscopy is currently the only method that can be used to determine if the material can be considered or treated as non-asbestos containing. Samples will be disposed of within 30 days unless notified in writing by the client. No part of this report may be reproduced, except in full, without written permission of the laboratory. The reporting limit is 1% by weight. NVLAP Lab Code 101350-0.

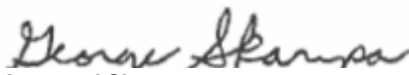
Respectfully submitted,
 PSI, Inc.


 Approved Signatory
 George Skarupa

Client ID	Lab ID (Layer)	Sample Description (Color, Texture, Etc.) <i>Analyst's Comment</i>	Asbestos Content (Percent and Type)	Non-asbestos Fibers (Percent and Type)
FT-D-02	011A	(1) White, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	2% Chrysotile NO ASBESTOS DETECTED	None Reported None Reported
FT-D-03	012A	(1) White, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	2% Chrysotile NO ASBESTOS DETECTED	None Reported None Reported
FT-E-01	013A	(1) Transparent, Mastic, Homogeneous (2) Black, Floor Tile, Homogeneous (3) Black, Mastic, Homogeneous	NO ASBESTOS DETECTED 2% Chrysotile NO ASBESTOS DETECTED	None Reported None Reported None Reported
FT-E-02	014A	(1) Transparent, Mastic, Homogeneous (2) Black, Floor Tile, Homogeneous (3) Black, Mastic, Homogeneous	NO ASBESTOS DETECTED 2% Chrysotile NO ASBESTOS DETECTED	None Reported None Reported None Reported
FT-E-03	015A	(1) Transparent, Mastic, Homogeneous (2) Black, Floor Tile, Homogeneous (3) Black, Mastic, Homogeneous	NO ASBESTOS DETECTED 2% Chrysotile NO ASBESTOS DETECTED	None Reported None Reported None Reported
FT-F-01	016A	(1) Transparent, Mastic, Homogeneous (2) Red, Floor Tile, Homogeneous (3) Black, Mastic, Homogeneous	NO ASBESTOS DETECTED 2% Chrysotile NO ASBESTOS DETECTED	None Reported None Reported None Reported
FT-F-02	017A	(1) Transparent, Mastic, Homogeneous (2) Red, Floor Tile, Homogeneous (3) Black, Mastic, Homogeneous	NO ASBESTOS DETECTED 2% Chrysotile NO ASBESTOS DETECTED	None Reported None Reported None Reported
FT-F-03	018A	(1) Transparent, Mastic, Homogeneous (2) Red, Floor Tile, Homogeneous (3) Black, Mastic, Homogeneous	NO ASBESTOS DETECTED 2% Chrysotile NO ASBESTOS DETECTED	None Reported None Reported None Reported
PL-G-01	019A	(1) White, Plaster, Homogeneous (2) Gray, Plaster, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
PL-G-02	020A	(1) White, Plaster, Homogeneous (2) Gray, Plaster, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
PL-G-03	021A	(1) White, Plaster, Homogeneous (2) Gray, Plaster, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
PL-G-04	022A	(1) White, Plaster, Homogeneous (2) Gray, Plaster, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
CT-H-01	023A	(1) White, Ceiling Tile, Homogeneous	NO ASBESTOS DETECTED	95% Fibrous Glass
CT-H-02	024A	(1) White, Ceiling Tile, Homogeneous	NO ASBESTOS DETECTED	95% Fibrous Glass

Quantitation is based on a visual estimation of the relative area of bulk sample components, unless otherwise noted in the "Comments" section of this report. The results are valid only for the item tested as received. This report may not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. Method used: E.P.A. Interim Method for the Determination of Asbestos in Bulk Insulation Samples (EPA 600/M4-82-020). Polarized Light Microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Quantitative Transmission Electron Microscopy is currently the only method that can be used to determine if the material can be considered or treated as non-asbestos containing. Samples will be disposed of within 30 days unless notified in writing by the client. No part of this report may be reproduced, except in full, without written permission of the laboratory. The reporting limit is 1% by weight. NVLAP Lab Code 101350-0.

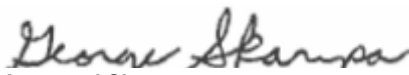
Respectfully submitted,
PSI, Inc.


Approved Signatory
George Skarupa

Client ID	Lab ID (Layer)	Sample Description (Color, Texture, Etc.) <i>Analyst's Comment</i>	Asbestos Content (Percent and Type)	Non-asbestos Fibers (Percent and Type)
CT-H-03	025A	(1) White, Ceiling Tile, Homogeneous	NO ASBESTOS DETECTED	95% Fibrous Glass
MP-I-01	026A	(1) Brown, Mastic, Homogeneous	NO ASBESTOS DETECTED	None Reported
MP-I-02	027A	(1) Brown, Mastic, Homogeneous	NO ASBESTOS DETECTED	None Reported
MP-I-03	028A	(1) Brown, Mastic, Homogeneous	NO ASBESTOS DETECTED	None Reported
DW-J-01	029A	(1) White, Drywall, Homogeneous (2) White, Joint Compound, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	15% Cellulose Fiber None Reported
DW-J-02	030A	(1) White, Drywall, Homogeneous (2) White, Joint Compound, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	15% Cellulose Fiber None Reported
DW-J-03	031A	(1) White, Drywall, Homogeneous (2) White, Joint Compound, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	15% Cellulose Fiber None Reported
FT-K-01	032A	(1) Black, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous (3) Red, Floor Tile, Homogeneous (4) Black, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED 2% Chrysotile NO ASBESTOS DETECTED	None Reported None Reported None Reported None Reported
FT-K-02	033A	(1) Black, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous (3) Brown, Floor Tile, Homogeneous (4) Black, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED 2% Chrysotile NO ASBESTOS DETECTED	None Reported None Reported None Reported None Reported
FT-K-03	034A	(1) Black, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous (3) Red, Floor Tile, Homogeneous (4) Black, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED 2% Chrysotile NO ASBESTOS DETECTED	None Reported None Reported None Reported None Reported
FT-L-01	035A	(1) Gray, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous <i>Inseparable Black and Yellow Mastic</i>	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
FT-L-02	036A	(1) Gray, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous <i>Inseparable Black and Yellow Mastic</i>	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported

Quantitation is based on a visual estimation of the relative area of bulk sample components, unless otherwise noted in the "Comments" section of this report. The results are valid only for the item tested as received. This report may not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. Method used: E.P.A. Interim Method for the Determination of Asbestos in Bulk Insulation Samples (EPA 600/M4-82-020). Polarized Light Microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Quantitative Transmission Electron Microscopy is currently the only method that can be used to determine if the material can be considered or treated as non-asbestos containing. Samples will be disposed of within 30 days unless notified in writing by the client. No part of this report may be reproduced, except in full, without written permission of the laboratory. The reporting limit is 1% by weight. NVLAP Lab Code 101350-0.

Respectfully submitted,
PSI, Inc.


Approved Signatory
George Skarupa

Analyst: Lori Huss

Work Order: 2308522

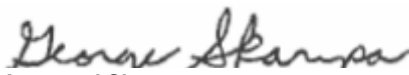
Page: 4 of 4

Client ID	Lab ID (Layer)	Sample Description (Color, Texture, Etc.) <i>Analyst's Comment</i>	Asbestos Content (Percent and Type)	Non-asbestos Fibers (Percent and Type)
FT-L-03	037A	(1) Gray, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous <i>Inseparable Black and Yellow Mastic</i>	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
FT-M-01	038A	(1) Red, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	2% Chrysotile 3% Chrysotile	None Reported None Reported
FT-M-02	039A	Sample Not Tested		
FT-M-03	040A	Sample Not Tested		
FT-N-01	041A	(1) Black, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
FT-N-02	042A	(1) Black, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
FT-N-03	043A	(1) Black, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
FT-O-01	044A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
FT-O-02	045A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
FT-O-03	046A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported

Report Notes: (PT) Point Count Results

Quantitation is based on a visual estimation of the relative area of bulk sample components, unless otherwise noted in the "Comments" section of this report. The results are valid only for the item tested as received. This report may not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. Method used: E.P.A. Interim Method for the Determination of Asbestos in Bulk Insulation Samples (EPA 600/M4-82-020). Polarized Light Microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Quantitative Transmission Electron Microscopy is currently the only method that can be used to determine if the material can be considered or treated as non-asbestos containing. Samples will be disposed of within 30 days unless notified in writing by the client. No part of this report may be reproduced, except in full, without written permission of the laboratory. The reporting limit is 1% by weight. NVLAP Lab Code 101350-0.

Respectfully submitted,
PSI, Inc.


Approved Signatory
George Skarupa

CHAIN OF CUSTODY .SB/LEAD/IH

2308522(3)

Project Information	
Project No:	0029-5992
Project Name:	Univ. of Mo - Hill Hall
Project Address:	506 South 6th Street, Columbia, MO 65201
Sample Date:	August 24, 2023

intertek
PSI

IH Laboratory
850 Poplar Street
Pittsburgh, PA 15220
412-922-4000

Send Results To:	
Company:	PSI
Attn:	Greg Chambliss
Address:	11826 Borman Drive, St. Louis, Missouri 63146
Telephone:	314-432-8073
Email:	

Send Invoice To:	
Company:	PSI
Attn:	Greg Chambliss
Address:	11826 Borman Drive, St. Louis, Missouri 63146
Telephone:	314-432-8073
Email:	greg.chambliss@intertek.com

Requested Turnaround Time:		
Same Day	1-2 Day	3-5 Day
☐	☐	☒
Requested Date:		9/5/23

Stop at First Positive	
Y	N
☒	☐

Laboratory Use Only	
All Samples In Acceptable Condition: ☐ Y ☐ N	
Comments:	
Shipping Charges Apply: ☐ ☐ ☐	

Parameter													
Sample ID:	Number of Samples	PLM Bulk	Point Count (400)	Point Count (1000)	Lead Wipe	Lead Air	Lead Soil	Lead Paint Chip	Lead TCLP	PCM	PCM "B Rules"	TEM AHERA	TEM 7402
Hill-PI-A-01.02.03	3	✓											
Hill-VC-B-01.02.03	3	✓											
Hill-CT-C-01.02.03	3	✓											
Hill-FT-D-01.02.03	3	✓											
Hill-FT-E-01.02.03	3	✓											
Hill-FT-F-01.02.03	3	✓											
Hill-PL-G-01.02.03	3	✓											
Relinquished by Hill-Red Hill - PL - 604 8/25/23													
Description:													
Total Chromium													
Zinc													
Cadmium													
Respirable Dust													
Total Nuisance Dust													
NY SOF-V													
NY TEM NOB													
NY PLM Friable/NOB													
TEM Wipe													
TEM Vacuum													
TEM Chatfield													
Pipe Fitting + Pipe Insulation													
Joint Vibration Cloth													
2'x2' Ceiling Tile													
12'x12' Floor Tile - white													
12'x12' Floor Tile - black													
12'x12' Floor Tile - red													
Plaster Walls													

Relinquished by		Received by	
Mpe Kimb		Michele Johnson	
Date/Time		Date/Time	
8/25/23		9.28.23	
Analyst Name:		Analyst Signature:	

Special Instructions / Comments:

CHAIN OF CUSTODY SB/LEAD/IH

2308522

Project Information

Project No: 0029-5992

Project Name: Univ. of MO - Hill Hall

Project Address: 506 S. 4th St., Columbia, MO 65201

Sample Date: August 24, 2023

intertek
PSI

IH Laboratory
850 Poplar Street
Pittsburgh, PA 15220
412-922-4000

Send Results To:

Company: PSI

Attn: Greg Chambliss

Address: 11826 Borman Drive, St. Louis, Missouri 63146

Telephone: 314-432-8073

Email:

Send Invoice To:

Company: PSI

Attn: Greg Chambliss

Address: 11826 Borman Drive, St. Louis, Missouri 63146

Telephone: 314-432-8073

Email: greg.chambliss@intertek.com

Requested Turnaround Time:

Same Day ☐ 1-2 Day ☐ 3-5 Day ☒ Requested Date: 9/5/23

Stop at First Positive

Y ☒ N ☐

Laboratory Use Only

All Samples in Acceptable Condition: Y ☐ N ☐

Comments:

Shipping Charges Apply: ☐

Parameter																									
Sample ID:	Number of Samples	PLM Bulk	Point Count (400)	Point Count (1000)	Lead Wipe	Lead Air	Lead Soil	Lead Paint Chip	Lead TCLP	PCM	PCM "B Rules"	TEM AHERA	TEM 7402	TEM Chatfield	TEM Vacuum	TEM Wipe	NY PLM Friable/NOB	NY TEM NOB	NY SOF-V	Total Nuisance Dust	Respirable Dust	Cadmium	Zinc	Total Chromium	Description:
Hill-CT-H-01.02.03	3	✓																						1'x1' Ceiling Tile	
Hill-MP-I-01.02.03	3	✓																						Mastic Putks	
Hill-DW-J-01.02.03	3	✓																						Drywall System	
Hill-FT-K-01.02.03	3	✓																						12"x12" Multilayer Floor	
Hill-FT-L-01.02.03	3	✓																						12"x12" Floor Tile - gray	
Hill-FT-M-01.02.03	3	✓																						12"x12" Floor Tile - Red	
Hill-FT-N-01.02.03	3	✓																						12"x12" Floor Tile - black	

Relinquished by My Kille **Date/Time** 8/25/23

Received by Michele Johnson **Date/Time** 8-28-23

Analyst Name: **Analyst Signature:**

Special Instructions / Comments:

230328

Project Information	
Project No:	0029-5992
Project Name:	Univ. of MD - Hill Hall
Project Address:	506 S. 6th St., Columbia, MO 65201
Sample Date:	AUGUST 24, 2023

Send Results To:	
Company:	PSI
Attn:	Greg Chambliss
Address:	11826 Borman Drive; St. Louis, Missouri 63146
Telephone:	314-432-8073
Email:	

Send Invoice To:	
Company:	PSI
Attn:	Greg Chambliss
Address:	11826 Borman Drive, St. Louis, Missouri 63146
Telephone:	314-432-8073
Email:	greg.chambliss@intertek.com

Requested Turnaround Time:			
Same Day	1-2 Day	3-5 Day	Requested Date:
☐	☐	☒	9/5/23

Stop at First Positive	
Y	☒
N	☐

Laboratory Use Only		Y	N
All Samples In Acceptable Condition:		☐	☐
Comments:			
Shipping Charges Apply:		☐	☐

Parameter		Description:	
Sample ID:	Number of Samples	PLM Bulk	Point Count (400)
Point Count (1000)	Lead Wipe	Lead Air	Lead Soil
Lead Paint Chip	Lead TCLP	PCM	PCM "B Rules"
TEM AHERA	TEM 7402	TEM Chatfield	TEM Vacuum
TEM Wipe	NY PLM Friable/NOB	NY TEM NOB	NY SOF-V
Total Nuisance Dust	Respirable Dust	Cadmium	Zinc
Total Chromium			

Relinquished by	Date/Time	Received by	Date/Time
My. Kinder	9/25/23	Nichole Johnston	9.28.23
		WJ-	2:24
Analyst Name:	Analyst Signature:		

Special Instructions / Comments:	
----------------------------------	--



APPENDIX B

XRF DATA TESTING TABLE

PSI Project #: 0029-5992
 Building: U of MO - Hill Hall
506 S. 6th St., Columbia, MO

XRF Device #: 2303
 Type of XRF: Viken Pb200e
 Operator's Name: Matthew Basch

Date of Survey: 08/24/23

XRF Testing Data Table

Paint film conditions are: Intact (I), Alligatoring (A), Blistering (B), Peeling (P), Chalking (C), and Cracking (CR).

Shot No.	Int/Ext	Room #	Wall	Component	Substrate	Paint Color	Paint Condition	XRF Reading	Result
1	Calibration							0.9	Pass
2								1.0	Pass
3								1.0	Pass
4	INT	South Stairwell	S	Wall	Brick	Tan	G	0.0	Negative
5	INT	South Stairwell	W	Wall	Brick	Tan	G	0.0	Negative
6	INT	South Stairwell	E	Wall	Brick	Tan	G	0.1	Negative
7	INT	South Stairwell	S	Window Frame	Wood	Brown	G	0.1	Negative
8	INT	South Stairwell	~	Railing	Metal	Brown	G	2.3	Positive
9	INT	South Stairwell	N	Door	Metal	Brown	G	0.1	Negative
10	INT	South Stairwell	N	Door Frame	Metal	Brown	G	0.1	Negative
11	INT	3rd Floor Hall	S	Wall	Plaster	Olive	G	0.1	Negative
12	INT	3rd Floor Hall	S	Wall	Brick	Olive	G	0.0	Negative
13	INT	3rd Floor Hall	E	Wall	Plaster	Olive	G	0.0	Negative
14	INT	3rd Floor Hall	E	Wall	Brick	Olive	G	0.0	Negative
15	INT	3rd Floor Hall	W	Fire Extinguisher Door	Metal	Red	G	0.2	Negative
16	INT	3rd Floor Hall	W	Elevator Door	Metal	Grey	G	0.2	Negative
17	INT	3rd Floor Hall	S	Elevator Door Frame	Metal	Grey	G	0.3	Negative
18	INT	3rd Floor Hall	W	Wall	Plaster	Olive	G	0.0	Negative
19	INT	3rd Floor Hall	W	Wall	Brick	Olive	G	0.0	Negative
20	INT	3rd Floor Hall	N	Wall	Plaster	Olive	G	0.0	Negative
21	INT	3rd Floor Hall	N	Wall	Brick	Olive	G	0.2	Negative
22	INT	3rd Floor Hall	N	Stairwell Door	Metal	Brown	G	0.2	Negative

XRF Testing Data Table

Paint film conditions are: Intact (I), Alligatoring (A), Blistering (B), Peeling (P), Chalking (C), and Cracking (CR).

Shot No.	Int/Ext	Room #	Wall	Component	Substrate	Paint Color	Paint Condition	XRF Reading	Result
23	INT	3rd Floor Hall	N	Door Frame	Metal	Grey	G	0.1	Negative
24	INT	North Stairwell	E	Wall	Brick	Tan	G	0.1	Negative
25	INT	North Stairwell	W	Wall	Brick	Tan	G	0.0	Negative
26	INT	North Stairwell	N	Wall	Brick	Tan	G	0.1	Negative
27	INT	North Stairwell	~	Railing	Metal	Brown	G	6.8	Positive
28	INT	North Stairwell	N	Window Frame	Wood	Brown	G	0.0	Negative
29	INT	North Stairwell	E	Metal Pannel	Metal	Brown/Tan	G	0.2	Negative
30	INT	North Stairwell	S	Wall	Brick	Tan	G	0.0	Negative
31	INT	North Stairwell	E	Wall	Brick	Tan	G	0.1	Negative
32	INT	North Stairwell	~	Railing	Metal	Brown	G	8.0	Positive
33	INT	North Stairwell	S	Door	Metal	Brown	G	0.2	Negative
34	INT	North Stairwell	S	Door Frame	Metal	Brown	G	0.1	Negative
35	INT	2nd Floor Hall	N	Wall	Plaster	Olive	G	0.0	Negative
36	INT	2nd Floor Hall	N	Wall	Brick	Olive	G	0.0	Negative
37	INT	2nd Floor Hall	E	Wall	Plaster	Olive	G	0.0	Negative
38	INT	2nd Floor Hall	E	Wall	Brick	Olive	G	0.0	Negative
39	INT	2nd Floor Hall	W	Wall	Drywall	Olive	G	0.1	Negative
40	INT	2nd Floor Hall	W	Elevator Door	Metal	Grey	G	0.2	Negative
41	INT	2nd Floor Hall	S	Elevator Door Frame	Metal	Grey	G	0.3	Negative
42	INT	2nd Floor Hall	W	Fire Extinguisher Door	Metal	Red	G	0.1	Negative
43	INT	2nd Floor Hall	S	Wall	Plaster	Olive	G	0.0	Negative
44	INT	2nd Floor Hall	S	Wall	Brick	Olive	G	0.0	Negative
45	INT	South Stairwell	S	Door	Metal	Brown	G	0.1	Negative
46	INT	South Stairwell	S	Door Frame	Metal	Brown	G	0.0	Negative

XRF Testing Data Table

Paint film conditions are: Intact (I), Alligatoring (A), Blistering (B), Peeling (P), Chalking (C), and Cracking (CR).

Shot No.	Int/Ext	Room #	Wall	Component	Substrate	Paint Color	Paint Condition	XRF Reading	Result
47	INT	South Stairwell	N	Wall	Brick	Tan	G	0.0	Negative
48	INT	South Stairwell	W	Wall	Brick	Tan	G	0.0	Negative
49	INT	South Stairwell	S	Wall	Brick	Tan	G	0.0	Negative
50	INT	South Stairwell	S	Window Frame	Wood	Brown	G	0.1	Negative
51	INT	South Stairwell	~	Railing	Metal	Brown	G	9.0	Positive
52	INT	South Stairwell	N	Wall	Brick	Tan	G	0.0	Negative
53	INT	South Stairwell	W	Wall	Brick	Tan	G	0.0	Negative
54	INT	South Stairwell	E	Wall	Brick	Tan	G	0.1	Negative
55	INT	South Stairwell	~	Railing	Metal	Brown	G	4.3	Positive
56	INT	South Stairwell	N	Door	Metal	Brown	G	0.1	Negative
57	INT	South Stairwell	N	Door Frame	Metal	Brown	G	0.1	Negative
58	INT	1st Floor Hall	S	Wall	Drywall	Olive	G	0.0	Negative
59	INT	1st Floor Hall	E	Wall	Drywall	Olive	G	0.0	Negative
60	INT	1st Floor Hall	W	Wall	Drywall	Olive	G	0.0	Negative
61	INT	1st Floor Hall	W	Fire Extinguisher Door	Metal	White	G	0.1	Negative
62	INT	1st Floor Hall	W	Elevator Door	Metal	Brown	G	0.3	Negative
63	INT	1st Floor Hall	W	Elevator Door Frame	Metal	Brown	G	0.4	Negative
64	INT	1st Floor Hall	N	Wall	Drywall	Olive	G	0.0	Negative
65	INT	1st Floor Hall	N	Door	Metal	Brown	G	0.1	Negative
66	INT	1st Floor Hall	N	Door Frame	Metal	Brown	G	0.1	Negative
67	INT	North Stairwell	S	Wall	Brick	Tan	G	0.0	Negative
68	INT	North Stairwell	E	Wall	Brick	Tan	G	0.0	Negative
69	INT	North Stairwell	W	Wall	Brick	Tan	G	0.0	Negative
70	INT	North Stairwell	~	Railing	Metal	Brown	G	6.4	Positive

XRF Testing Data Table

Paint film conditions are: Intact (I), Alligatoring (A), Blistering (B), Peeling (P), Chalking (C), and Cracking (CR).

Shot No.	Int/Ext	Room #	Wall	Component	Substrate	Paint Color	Paint Condition	XRF Reading	Result
71	INT	1st Floor Janitor's	N	Wall	Plaster	Green	G	0.0	Negative
72	INT	1st Floor Janitor's	W	Door	Wood	Varnish	G	0.2	Negative
73	INT	1st Floor Janitor's	W	Door Frame	Metal	Brown	G	0.5	Negative
74	INT	1st Floor Hall	E	Door	Wood	Varnish	G	0.0	Negative
75	INT	1st Floor Hall	~	Door Frame	Metal	Brown	G	0.3	Negative
76	INT	1st Floor East Stairwell	S	Wall	Plaster	Green	G	0.0	Negative
77	INT	1st Floor East Stairwell	S	Wall	Brick	Green	G	0.0	Negative
78	INT	1st Floor East Stairwell	N	Wall	Plaster	Green	G	0.1	Negative
79	INT	1st Floor East Stairwell	N	Wall	Brick	Green	G	0.0	Negative
80	INT	1st Floor East Stairwell	~	Railing	Metal	Brown	G	0.3	Negative
81	INT	1st Floor East Stairwell	E	Door	Metal	White	G	0.1	Negative
82	INT	1st Floor East Stairwell	E	Door Frame	Metal	White	G	0.1	Negative
83	INT	1st Floor North Stairwell	N	Window Frame	Wood	Varnish	G	0.1	Negative
84	INT	1st Floor North Stairwell	S	Wall	Brick	Tan	G	0.0	Negative
85	INT	1st Floor North Stairwell	W	Wall	Brick	Tan	G	0.0	Negative
86	INT	1st Floor North Stairwell	~	Railing	Metal	Brown	G	0.4	Negative
87	INT	1st Floor North Stairwell	S	Door	Metal	Brown	G	0.1	Negative
88	INT	1st Floor North Stairwell	~	Door Frame	Metal	Brown	G	0.1	Negative
89	INT	Ground Floor Hall	N	Wall	Plaster	Olive	G	0.0	Negative
90	INT	Ground Floor Hall	N	Wall	Brick	Olive	G	0.1	Negative
91	INT	Ground Floor Hall	W	Wall	Plaster	Olive	G	0.0	Negative
92	INT	Ground Floor Hall	W	Wall	Brick	Olive	G	0.0	Negative
93	INT	Ground Floor Hall	W	Fire Extinguisher Door	Metal	Red	G	0.2	Negative
94	INT	Ground Floor Hall	S	Wall	Plaster	Olive	G	0.2	Negative

XRF Testing Data Table

Paint film conditions are: Intact (I), Alligatoring (A), Blistering (B), Peeling (P), Chalking (C), and Cracking (CR).

Shot No.	Int/Ext	Room #	Wall	Component	Substrate	Paint Color	Paint Condition	XRF Reading	Result
95	INT	Ground Floor Hall	S	Wall	Brick	Olive	G	0.0	Negative
96	INT	Ground Floor Hall	S	Door	Metal	Brown	G	0.0	Negative
97	INT	Ground Floor Hall	S	Door Frame	Metal	Brown	G	0.1	Negative
98	INT	Ground South Stairwell	N	Wall	Brick	Tan	G	0.1	Negative
99	INT	Ground South Stairwell	E	Wall	Brick	Tan	G	0.0	Negative
100	INT	Ground South Stairwell	W	Wall	Brick	Tan	G	0.0	Negative
101	INT	Ground South Stairwell	~	Railing	Metal	Brown	G	0.2	Negative
102	INT	Ground Janitor's	W	Wall	Plaster	Green	G	0.1	Negative
103	INT	Ground Janitor's	W	Door	Wood	Varnish	G	0.0	Negative
104	INT	Ground Janitor's	W	Door Frame	Metal	Gray	G	0.4	Negative
105	INT	Mechanical Room	E	Door	Metal	Gray	G	0.1	Negative
106	INT	Mechanical Room	E	Door Frame	Metal	Gray	G	0.4	Negative
107	INT	Mechanical Room	W	Wall	Concrete	White	G	0.0	Negative
108	INT	Mechanical Room	S	Wall	Brick	White	G	0.0	Negative
109	INT	Mechanical Room	E	Door	Metal	Gray	G	8.1	Positive
110	INT	Mechanical Room	E	Door Frame	Metal	Gray	G	0.3	Negative
111	EXT	Ground Floor North Entry	S	Door	Wood	Red	G	0.0	Negative
112	EXT	Ground Floor North Entry	S	Door Frame	Wood	Off White	G	25.3	Positive
113	INT	Ground Floor North Entry	N	Door	Wood	Red	G	0.0	Negative
114	INT	Ground Floor North Entry	N	Door Frame	Wood	Varnish	G	0.2	Negative
115	INT	Ground Floor North Entry	E	Wall	Plaster	White	G	0.0	Negative
116	INT	Ground Floor North Entry	W	Wall	Plaster	White	G	0.0	Negative
117	INT	Ground Floor North Entry	N	Door	Wood	Varnish	G	0.0	Negative
118	INT	Ground Floor North Entry	N	Door Frame	Metal	White	G	0.1	Negative

XRF Testing Data Table

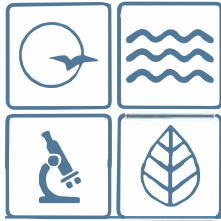
Paint film conditions are: Intact (I), Alligatoring (A), Blistering (B), Peeling (P), Chalking (C), and Cracking (CR).

Shot No.	Int/Ext	Room #	Wall	Component	Substrate	Paint Color	Paint Condition	XRF Reading	Result
119	Calibration							1.0	Pass
120								0.9	Pass
121								1.0	Pass



APPENDIX C

PERSONNEL/LABORATORY ACCREDITATIONS



MISSOURI DEPARTMENT OF NATURAL RESOURCES

Michael L. Parson
Governor

Dru Buntin
Director

June 1, 2023

Megan Kienker
11826 Borman Dr.
St Louis, MO 63146

RE: Missouri Asbestos Occupation Certification Card

Enclosed is your certification card for Asbestos Inspector, as issued by the Asbestos Unit of the Missouri Department of Natural Resources' Air Pollution Control Program.

Missouri Certification Number: 7136052623MOIR21662
Course Training Date: May 26, 2023
Missouri Certification Approval Date: June 01, 2023
Missouri Certification Expiration Date: June 01, 2024

Note:

- All Missouri-certified asbestos personnel must comply with the following statutes and regulations:
 - Sections 643.225 to 643.250, RSMo;
 - 10 CSR 10-6.241 *Asbestos Projects-Registration, Abatement, Notification, Inspection, Demolition, and Performance Requirements*; and
 - 10 CSR 10-6.250 *Asbestos Projects-Certification, Accreditation and Business Exemption Requirements*.
- To keep your occupation certification up-to-date, you must complete an annual refresher course and submit a renewal application each year.
- In order to be eligible to renew your certification, you must successfully complete a refresher course with a Missouri-accredited training provider within 12 months of the expiration date of your current training certificate. If you exceed this grace period, you will be required to retake a Missouri-accredited initial course in order to be eligible for Missouri certification.

To obtain a copy of the certification renewal application, or review regulations and requirements, please visit our website at <http://dnr.mo.gov/env/apcp/asbestos/index.htm>.

If you have any questions please call the Air Pollution Control Program at 573-751-4817.

AIR POLLUTION CONTROL PROGRAM

Director of Air Pollution Control Program



STATE OF MISSOURI
DEPARTMENT OF HEALTH AND SENIOR SERVICES

LEAD OCCUPATION LICENSE REGISTRATION

Issued to:

Matthew E. Basch

The person, firm or corporation whose name appears on this certificate has fulfilled the requirements for licensure as set forth in the Missouri Revised Statutes 701.300-701.338, as long as not suspended or revoked, and is hereby authorized to engage in the activity listed below.

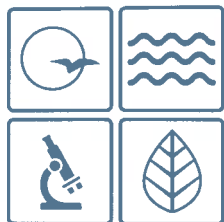
Lead Inspector
Category of License

Issuance Date: **3/30/2022**
Expiration Date: **3/30/2024**
License Number: **220330-300006255**



Paula F. Nickelson

Paula F. Nickelson
Acting Director
Department of Health and Senior Services



MISSOURI

DEPARTMENT OF NATURAL RESOURCES

Michael L. Parson
Governor

Dru Buntin

August 18, 2023

Matthew E Basch
11826 Borman Dr
St Louis, MO 63146

RE: Missouri Asbestos Occupation Certification Card

Enclosed is your certification card for Asbestos Inspector, as issued by the Asbestos Unit of the Missouri Department of Natural Resources' Air Pollution Control Program.

Missouri Certification Number: 7118081823MOIR12911
Course Training Date: August 18, 2023
Missouri Certification Approval Date: August 21, 2023
Missouri Certification Expiration Date: August 21, 2024

Note:

- All Missouri-certified asbestos personnel must comply with the following statutes and regulations:
 - Sections 643.225 to 643.250, RSMo;
 - 10 CSR 10-6.241 *Asbestos Projects-Registration, Abatement, Notification, Inspection, Demolition, and Performance Requirements; and*
 - 10 CSR 10-6.250 *Asbestos Projects-Certification, Accreditation and Business Exemption Requirements.*
- To keep your occupation certification up-to-date, you must complete an annual refresher course and submit a renewal application each year.
- In order to be eligible to renew your certification, you must successfully complete a refresher course with a Missouri-accredited training provider within 12 months of the expiration date of your current training certificate. If you exceed this grace period, you will be required to retake a Missouri-accredited initial course in order to be eligible for Missouri certification.

To obtain a copy of the certification renewal application, or review regulations and requirements, please visit our website at <http://dnr.mo.gov/env/apcp/asbestos/index.htm>.

If you have any questions please call the Air Pollution Control Program at 573-751-4817.

AIR POLLUTION CONTROL PROGRAM

Director of Air Pollution Control Program



United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 101350-0

Intertek-PSI, Inc.

Pittsburgh, PA

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*

Asbestos Fiber Analysis

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).*

2023-07-01 through 2024-06-30

Effective Dates



A handwritten signature in dark ink, appearing to read "Dana S. Laman".

For the National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

Intertek-PSI, Inc.

PSI, Inc.

850 Poplar Street

Pittsburgh, PA 15220

Morgan Ryan

Phone: 304-670-8925

Email: morgan.ryan@intertek.com

http://www.intertek.com

ASBESTOS FIBER ANALYSIS

NVLAP LAB CODE 101350-0

Bulk Asbestos Analysis

Code

18/A01

Description

EPA -- 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples



18/A03

EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Airborne Asbestos Analysis

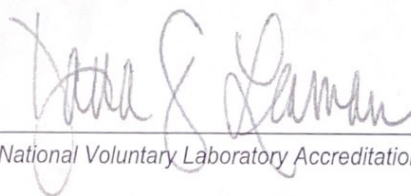
Code

18/A02

Description

U.S. EPA's "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Nonmandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR, Part 763, Subpart E, Appendix A.





For the National Voluntary Laboratory Accreditation Program

SECTION 04 0100
MAINTENANCE OF MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Clay facing brick.
- B. Mortar.
- C. Water and chemical cleaning of brick and stone surfaces.
- D. Sealing of stone masonry.
- E. Replacement of damaged brick units.
- F. Repointing mortar joints.
- G. Repair of damaged masonry.
- H. Injection grouting.
- I. Crack stitching.
- J. Removable of soluble salts from stone.
- K. Stone consolidation.
- L. Stone repair with patching mortar.
- M. Removing and reinstalling of items that would interfere with the proper execution of work regardless of whether items are shown on drawings.
- N. Accessories.
- O. Miscellaneous items not specifically listed or shown on drawings but required for proper completion of work.

1.02 DEFINITIONS

- A. Defective Mortar Joints: Joints that are open, unsound, soft, loose, cracked (larger than 0.016 in.), broken, eroded more than 1/4 inch, crumbly or otherwise disintegrated mortar that would impair its proper performance.
- B. Defective Brick: Brick that is unsound, cracked, broken, spalled, crazed, effloresced, or otherwise deteriorated that would impair its proper performance.

1.03 PRICE AND PAYMENT PROCEDURES

- A. See Bid Form, for Unit Price requirements and Base Bid quantities.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week prior to commencing work of this section.
 - 1. Require attendance of parties directly affecting work of this section.
 - 2. Review conditions of installation, installation procedures, and coordination with related work.

1.05 SUBMITTALS

- A. See Division One for submittal procedures.
- B. Product Data:
 - 1. Brick masonry units.
 - 2. Cleaning compounds and cleaning solutions.
 - 3. Water repellents.
 - 4. Mortar: Include design mix using the Proportion specification of ASTM C 270.
 - 5. Crack Stitching system.

6. Repair Mortar.
7. Injection Grout.
8. Stone Consolidation Products.
9. Accessories.
- C. Reports: Submit reports on mortar indicating conformance of component mortar materials to requirements of ASTM C 270 and test and evaluation reports per ASTM C 780
- D. Samples: Provide individual brick samples, that illustrate full range of color and texture of brick being replaced.
- E. Manufacturer's Instructions:
 1. For cleaning materials, indicate special procedures, conditions requiring special attention.
 2. For repair mortar.
 3. For injection grouting.
 4. For stone consolidation, include cleaning and recommended application procedures.
- F. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.
- G. Restoration Company Qualifications.
- H. Restoration Worker Qualifications.
- I. Contractor Work Plan: Submit detailed written plan indicating staging, access, protection, staffing, and general workflow related to how work is proposed to be completed.

1.06 QUALITY ASSURANCE

- A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.
- B. Comply with provisions of the Brick Industry Association (BIA) Technical Notes on Brick Construction, except where exceeded by requirements of the contract documents.
- C. Restoration Company Qualifications: Company specializing in masonry restoration with minimum five years of documented experience. Submit list of a minimum of five (5) similar completed projects with names and telephone numbers of contact person.
- D. Restoration Worker Qualifications: Submit list of a minimum of five (5) similar completed projects with names and telephone numbers of contact person. Indicate the responsibilities of workers assigned to this project.

1.07 MOCK-UPS

- A. Repoint an existing masonry wall area sized 8 feet long by 6 feet high.
- B. Use tools, methods and products that will be used on actual work. If it cannot be successfully demonstrated to the satisfaction of the Owner's Project Representative that power tools can be used to accomplish work without damage to adjacent materials, then hand tools will be required to perform work.
- C. The masonry mockups shall demonstrate the minimum standard for the following:
 1. Rebuilding of brick
 2. Repointing of brick and stone.
 3. Sealant joints specified in Section 07 9200.
 4. Stone patching with repair mortar.
- D. Locate where directed.
- E. Acceptable panel and procedures employed will become the standard for work of this section.
- F. Mock-up may remain as part of the Work.
- G. Mock-up must be completed and approved before start of construction.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver masonry neatly stacked and tied on pallets. Store clear of ground with adequate waterproof covering.
- B. Store restoration cleaner, water repellent materials, and stone consolidation products in manufacturer's packaging.

1.09 FIELD CONDITIONS

- A. Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.
- B. Protect landscaping and lawns from construction operations in a manner acceptable to Owner's Project Representative.
- C. Do not cut, grind, clean, seal or use process creating dust, dirt or airborne liquid when wind is over 10 mph, unless special precautions approved by the Owner's Representative are implemented to prevent adjacent non-project related damage.
- D. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.
- E. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

PART 2 PRODUCTS

2.01 BRICK UNITS

- A. Acceptable Products:
 - 1. Type B1: Bowerston Brick; www.bowerstonshale.com:
 - a. Product: Hoosier Blend R/T NBLK, NNAV..
 - b. Size: Modular.
 - c. Plant: Bowerston, Ohio.
 - d. Distributor: Midwest Block and Brick; 573-635-7119.
 - 2. Substitutions: See Division One.
- B. Facing Brick: ASTM C216, Type FBS, Grade SW, with a rating of "no efflorescence" when tested according to ASTM C67.
 - 1. Special shapes: Molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect.
- C. Lab certification of brick shall be based on samples taken from bricks produced for the project and must be approved prior to delivery. The Owner may retain an independent testing agency to randomly test brick delivered to the site for compliance.

2.02 CLEANING MATERIALS

- A. Basis of Design - Brick & Stone Cleaning Agent: PROSOCO Sure Klean Light Duty Restoration Cleaner; www.prosoco.com.
- B. Basis of Design (for Heavier Stains) - PROSOCO Enviro Klean Reclaim; www.prosoco.com.
- C. Substitutions: See Division One.

2.03 WATER REPELLENT

- A. Basis of Design - Water Repellent for Stone: PROSOCO Sure Klean Natural Stone Treatment WB Plus; www.prosoco.com.
- B. Substitutions: See Division One.

2.04 MORTAR MATERIALS

- A. Portland Cement: ASTM C150, Type I.
 - 1. **Not more than 0.60 percent alkali.**
 - 2. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979.

- a. Color(s): As required to match existing adjacent mortar. Adjust proportions as required by field conditions.
- 3. Hydrated Lime: ASTM C 207, Type S.
- 4. Mortar Aggregate: ASTM C 144.
- 5. Water: Clean and potable.

2.05 MORTAR MIXES

- A. Mortar for Unit Masonry: ASTM C 270, Proportion Specification.
 - 1. Exterior, loadbearing and non-loadbearing masonry: Type N.
 - a. Replicate the existing mortar in color, texture, tooling, general composition and appearance. Between new mortar and aged mortar, maintain the continuity of surface that has developed from age and weathering.
 - 2. Admixtures: Use admixtures only if approved by Architect in writing. Add to mixture at manufacturer's recommended rate and in accordance with manufacturer's instructions; mix uniformly.

2.06 MORTAR MIXING

- A. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM C270 and in quantities needed for immediate use.
- B. Maintain sand uniformly damp immediately before the mixing process.
- C. Do not use anti-freeze compounds to lower the freezing point of mortar.
- D. If water is lost by evaporation, re-temper only within two hours of mixing.
- E. Colored Mortar: Proportion selected pigments and other ingredients to match existing adjacent mortar without exceeding manufacturer's recommended pigment-to-cement ratio; mix in accordance with manufacturer's instructions; uniform in coloration.

2.07 REPAIR MORTAR

- A. Basis of Design - Cathedral Stone Products, Inc.; Jahn; Product M70, Limestone Repair Mortar; www.cathedralstone.com.
 - 1. Color/Texture/Profile: Match adjacent surface of stone that is being repaired.
- B. Substitutions: See Division One.

2.08 STONE CONSOLIDATION

- A. Basis of Design – Prosoco T-2229 Desalination Poultice; www.prosoco.com.
- B. Basis of Design – Prosoco Conservare OH100 Consolidant; www.prosoco.com.
- C. Substitutions: See Division One.

2.09 INJECTION GROUT.

- A. Basis of Design - Cathedral Stone Products, Inc.; Jahn; Product M32, Micro Injection Grout; www.cathedralstone.com.
- B. Substitutions: See Division One.

2.10 CRACK STITCHING MATERIALS

- A. Basis of Design: HeliFix; www.helifix.com.
 - 1. HeliBars; 4.5 mm Stainless Steel, Grade 304.
 - 2. HeliBond Grout.
- B. Substitutions: See Division One.

2.11 REINFORCEMENT AND ANCHORAGE

- A. Anchors:
 - 1. Basis-of-Design: Hohmann & Barnard, Inc.; Product: HB-213 Adjustable Veneer Anchor; www.h-b.com.

- a. Material: Stainless Steel, Type 304.
- 2. Substitutions: See Division One.

2.12 FLASHINGS

- A. Combination Non-Asphaltic Flashing Materials - Stainless Steel:
 - 1. Stainless Steel/Polymer Fabric Flashing - Self-adhering: ASTM A240/A240M; 2 mil type 304 stainless steel sheet bonded on inward facing side to a sheet of polymer fabric that has a clear adhesive with a removable release liner.
 - a. Manufacturers:
 - 1) Hohmann & Barnard, Inc; Mighty-Flash SA Self-Adhering SS Fabric Flashing: www.h-b.com.
 - 2) Substitutions: See Division One.
- B. Drip Edges:
 - 1. Basis-of-Design: Hohmann & Barnard, Inc.; Product: DP - Drip Plate; www.h-b.com.
 - a. Material: Stainless Steel, Type 304.
 - b. Width: 3-inch.
 - 2. Substitutions: See Division One.
- C. Flashing Sealant/Adhesives: Specified in Section 07 9200.

2.13 ACCESSORIES

- A. Joint Filler: Specified in Section 07 9200.
- B. Control Joint Filler:
 - 1. Basis-of-Design: Hohmann & Barnard, Inc. Product: NS – Closed Cell Neoprene Sponge; www.h-b.com.
 - 2. Substitutions: See Division One.
- C. Termination Bars:
 - 1. Basis-of-Design: Hohmann & Barnard, Inc. Product: T2 – Termination Bar; www.h-b.com.
 - a. Material: Stainless Steel, Type 304.
 - 2. Substitutions: See Division One.
- D. Weep Tubes:
 - 1. Basis-of-Design: Hohmann & Barnard, Inc. Product: #341W/S – Weep Tubes with pre-installed wick and stainless steel insect screen; www.h-b.com.
 - 2. Substitutions: See Division One.
- E. Cell Vents:
 - 1. Basis-of-Design: Hohmann & Barnard, Inc. Product: QV – Quadro-Vent; www.h-b.com.
 - 2. Substitutions: See Division One.
- F. Primer for Stainless Steel/Polymer Fabric Flashing: Primer for self- adhering flashing as recommended by manufacturer.
- G. Mastic/ sealant: H - B Mastic or manufacturer approved urethane sealant.
- H. Setting Devices:
 - 1. Types: Pins, dowels, clips, anchors, straps, tiebacks, bolts, washers, nuts, and other devices of type, size, and configuration required by conditions.
 - 2. Material: ASTM for stainless steel applicable to device, Type 304.
 - 3. Available Manufacturers:
 - a. Ferro Corporation.
 - b. Halfen Anchoring Systems.
 - c. Heckman Building Products.
 - d. Holmann & Barnard.

- e. Krando Metal Products.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces to be cleaned and restored are ready for work of this section.

3.02 PREPARATION

- A. Protect surrounding elements from damage due to restoration procedures.
- B. Carefully remove and store removable items located in areas to be restored that interfere with the work. Reinstall upon completion.
- C. Verify joint sealants are installed and cured.
- D. Verify surfaces to be coated with water repellent are dry, clean, and free of efflorescence, oil, or other matter detrimental to application of water repellent.
- E. Separate areas to be protected from restoration areas using means adequate to prevent damage.
- F. Cover existing landscaping with tarpaulins or similar covers.
- G. Mask immediately adjacent surfaces with material that will withstand cleaning and restoration procedures.
- H. Protect roofing and flashings from damage with 1/2-inch plywood laid over 1 inch polystyrene on roof surfaces over full extent of work area and traffic route. Other protection means may be used ONLY when requested in writing and approved in writing by Owner's Representative.
- I. Take precautions to avoid harm to building occupants, pedestrians and autos.
- J. Construct covered pedestrian safe walkways in areas of pedestrian traffic.
- K. When using cleaning methods that involve water or other liquids, install drainage devices to prevent runoff over adjacent surfaces unless those surfaces are impervious to damage from runoff.
- H. Do not allow cleaning runoff to drain into sanitary or storm sewers.

3.03 REPAIR MORTAR - STONE PATCHING

- A. Mix approximately 5 to 5-1/2 parts powder to 1 part powder to 1 part water by volume, depending on temperature and humidity. Add the powder to the water slowly. Continue mixing until the mortar is thoroughly mixed and is the approximate consistence of damp sand.
- B. Preparation: Prepare surfaces in accordance with Manufacturer's instructions. Surfaces to receive Repair Mortar must be sound and free of dust, dirt, grease, laitance and any other coating or foreign substance that would prevent proper adhesion. Remove all loose and deteriorated concrete from the repair area a minimum of 1/2 inch deep. Follow the direction of the crack being repaired using manual or pneumatic cutting techniques with square cut edges in accordance with the manufacturer's installation instructions. Do not feather the edges of repair.
- C. Application: Apply in accordance with Manufacturer's instruction.
 - 1. Moisten the substrate using clean water. Apply to a glistening wet surface. Do not allow surface to dry out.
 - 2. Mix the mortar to the consistency of wet putty. Apply to the glistening wet substrate approximately 1/8 inch thick. Do not allow this coat to dry out prior to the application of the 5:1 mix.
 - 3. Build up the 5:1 material beyond the surface of the substrate. After achieving initial set, scrape away excess mortar until profile is flush with adjacent surfaces.
- D. Curing and Clean Up: Cure and clean up in accordance with manufacturer's instructions.

1. Periodically mist repairs using clean water for at least a 72-hour period in accordance with manufacturer's instructions.
2. Remove uncured mortar from the perimeter of repair before it dries using clean water and a rubber sponge. Repeat several times to prevent staining of adjacent material.

3.04 REBUILDING

- A. Cut out damaged and deteriorated masonry with care in a manner to prevent damage to any adjacent remaining materials.
- B. Support structure as necessary in advance of cutting out units.
- C. Cut away loose or unsound adjoining masonry and mortar as directed.
- D. Build in new units following procedures for new work specified in other section(s).
- E. Mortar Mix: Colored and proportioned to match existing work.
- F. Ensure that anchors, ties, and flashings are correctly located and built in.
- G. Install built in masonry work to match and align with existing, with joints and coursing true and level, faces plumb and in line. Build in all openings, accessories and fittings.

3.05 COURSING

- A. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- B. (Brick) Bond: Match existing. Cut brick as required to match header bricks.
- C. Mortar Joints: Concave.

3.06 REPOINTING

- A. Inspect the entire building as the work progresses; field verifying locations and quantities of work to be performed. As work is identified and performed, provide lifts or other acceptable means of access to the work and notify Owner's Representative for verification of quantities of work completed.
- B. Perform repointing prior to cleaning masonry surfaces.
- C. Cut out all mortar in joints to minimum 3/4-inch depth; maximum 1 inch depth or until sound mortar is reached. Cut out with a maximum 1/8-inch blade run through the center of the joint - if approved in mock- up. Chip out remainder of mortar adjacent to the masonry using hand tools, unless, in approved mock- up, it can be demonstrated that larger blade may be used without damaging adjacent masonry.
- D. Use power tools only after test cuts determine no damage to masonry units will result.
- E. Do not damage masonry units.
- F. When cutting is complete, remove dust and loose material by brushing.
- G. Premoisten joint and apply mortar. Pack tightly in maximum 1/4 inch layers. Form a smooth, compact concave joint to match existing.
- H. Moist cure for 72 hours.

3.07 WEEPS and CELL VENTS

- A. Install weep tubes and/or cell vents as noted on drawings, in veneer and cavity walls at maximum 16-inches on center horizontally above through-wall flashing and above shelf angles and lintels. Install in accordance with manufacturer's printed installation instructions.

3.08 SEALANT JOINTS

- A. Sealant Joints: Carefully cut out mortar and sealant joints designated to receive new sealant. Cut to a minimum depth of 3/4", or to sound mortar. If deeper than 3/4", repoint with mortar up to a depth of 3/4" from the masonry surface. Clean void of all old sealant, loose particles and dust, in preparation to receive sealant specified in Section 07 9200.

3.09 STONE CONSOLIDATION

- A. Preparation – Remove soluble salt contamination from the indicated stone surfaces using a desalination poultice.
1. Install per manufacturer directions mixing the poultice as required to achieve a trowelable consistency.
 2. Once uniformly mixed, apply the prepared poultice to all affected areas.
 3. Cover the poulticed area with light polyethylene film or other moisture resistant material. Secure the film against the poultice, sealing the edges to slow evaporation.
 4. Allow the poultice and protective film to remain in place for 24 hours.
 5. After 24 hours, remove the protective film. If the poultice is still moist, allow it to dry completely.
 6. Scrape the dried poultice off carefully. Using a stiff-fibered scrubbing brush and fresh water, wash the treated surfaces, removing all traces of the poultice paste. Retain the removed material for testing purposes.
 7. Allowed the treated surfaces to completely dry.
 8. Laboratory test the removed poultice clay for any residual salt levels.
 9. Repeat the above steps as necessary until all soluble salts have been removed.
- B. Consolidation Treatment
1. Install per manufacturer field representative direction.
 2. Conduct field testing under the guidance of manufacturers field representative to determine recommended application procedure for the consolidation treatment.
 3. Apply only when surface and air temperatures are between 50 to 90-degrees F. and relative humidity is greater than 40-percent.
 4. Apply by low-pressure spray or brush in a manner that will not further damage the stone.
 5. Ensure proper penetration and prevent crust formations by applying consolidation chemicals in a repeated series of applications referred to as "cycles." A cycle consists of three successive saturating applications at 5–15 minute intervals. Typical treatment will involve two to three cycles (6–9 separate applications). Allow 20 to 60 minutes between cycles.
- Field testing is required to determine the time between applications and between cycles.*
- Continue with treatment until excess material remains visible on the stone surface for 60 minutes following the last application.
6. Immediately flush excess surface materials using industrial grade MEK (methyl ethyl ketone) or mineral spirits. Contain any runoff from cleaning operations and dispose of such material legally and off-site.
 7. Protect the treated area from rain for 48-hours following final application.
 8. When cured, apply compatible stone sealant to the treated surface.

3.10 INJECTION GROUTING - STONE (Cracks wider than 1/16")

- A. Contractor shall inspect the entire building and be responsible for field verifying locations and quantities of work to be performed. As work is identified and performed, provide lifts or other acceptable means of access to the work and notify Owner's Representative for verification of quantities of work completed.
- B. Preparation
 - 1. Transverse Cracks: Drill a series of injection ports in the center of the crack in a downward direction. Between the ports, the crack should be sealed with removable, non-staining clay or repaired with the appropriate restoration mortar.
 - 2. Wash the surface and interior of the crack using clean water to remove all dust, loose or deleterious material, which could prevent proper flow and/or adhesion.
- C. Mixing
 - 1. Do not mix more material than can be used within approximately 30 minutes. Discard any mixed material that has been unused for 30 minutes or more.
 - 2. Mix mechanically at approximately 2 to 5 parts powder to 1 part water by volume, using a high-speed drill (3,000 RPM or higher) equipped with a Jifflier type-mixing paddle. After mixing, pour into another clean container using a sieve.
- D. Injection Procedure
 - 1. Wash the interior of the crack immediately before injection by flushing with clean water. If the crack is allowed to dry out before grout is injected, repeat this step.
 - 2. Treatment of Transverse Cracks: Inject grout into lowest port and continue until it flows freely from this port and other ports at the same level. Seal ports using non-staining clay, sealant, or caulk and proceed in identical fashion until the crack is filled. Clean up overflow immediately.
 - 3. Remove plugs after 24 to 48 hours and repair the ports and the crack surface, if not previously performed, using an appropriate restoration mortar to match color and type of existing stone.

3.11 CRACK STITCHING

- A. Install reinforcing rods per manufacturer instructions.
 - 1. Rake out and/or cut mortar joint to between 1-inch and 1-1/4-inch deep.
 - 2. Clean cut-out slots, flush with clean water and thoroughly soak the substrate in the slot.
 - 3. Inject a continuous bead of manufacturer-recommended repair grout into the back of the slot.
 - 4. Push the reinforcing rod securely and uniformly into the slot.
 - 5. Install another continuous bead of repair grout over the reinforcing rod, leaving a 1/2-inch-deep joint from the face of brick.
 - 6. Repoint the remaining joint with mortar.
- B. Spacing:
 - 1. Horizontal: Rods to extend a minimum of 20" to each side of the crack. Where a crack is less than 20" from the end of a wall or opening, bend and return the reinforcing rod a minimum of 4-inches around the corner.
 - 2. Vertical: Install rods every 6 courses, spaced equally, at areas indicated on drawings.

3.12 CHEMICAL CLEANING OF MASONRY

- A. Before full-scale application of cleaning products begins, review manufacturers application data to determine suitability of cleaning of specific materials and surfaces. Apply cleaner to test area to determine optimum dwell time, compatibility, effectiveness, rinsing and other pertinent application procedures that would affect the effectiveness of the cleaning operations with respect to desired results. Use the least caustic materials and methods required to produce desired results. Allow test areas to dry thoroughly before evaluating the final results with the Architect and Owner's Project Representative.
- B. At new masonry, verify mortar is fully set and cured.
- C. Apply cleaner in accordance with manufacturers recommendations. If improvements are necessary to achieve proper cleaning of surfaces, alternate cleaning methods may be used only with approval of the Owners Project Representative and the Architect.
- D. Clean surfaces and remove large particles with wood scrapers or non-ferrous wire brush.
- E. Spray coat masonry with cleaning agent, mixed into solution in accordance with manufacturer's instructions.
- F. Allow sufficient time for solution to remain on masonry and agitate with soft fiber brush or sponge.
- G. Rinse from the bottom up with potable water applied at recommended rate of 400 psi and at a rate of 4 gal/min. Make sure to cover each portion of the masonry surface with a concentrated stream of water. To avoid streaking, keep wall surfaces immediately below area being cleaned running wet and free of cleaner rundown and residue.

3.13 AGING

- A. Rub in new masonry work to match, as close as possible, adjacent original work.
 - 1. Use carbon black in small amounts, rubbing in well with burlap rags.
- B. After each application, dust off surplus and wash down with low pressure hose. Allow surface to dry before proceeding with succeeding applications.
- C. Continue process until acceptance.

3.14 WATER REPELLENT APPLICATION

- A. Apply water repellent in accordance with manufacturer's instructions, using procedures and application methods recommended as producing the best results.
- B. Apply at rate recommended by manufacturer, continuously over entire surface.
- C. For vertical application, apply "wet-on-wet" to a visibly dry and absorbent surface.
- D. For spray application, saturate from the bottom up creating a 4"- 8" rundown below the spray contact point. Let the first application penetrate for 5-10 minutes. Re-saturate.
- E. For brush or roller application, saturate uniformly. Let penetrate for 5-10 minutes. Brush out heavy runs and drips that don't penetrate.
- F. For horizontal application, saturate in a single application. Use enough to keep the surface wet for 2-3 minutes before penetration. Brush out puddles until they soak in.
- G. For dense surface application, apply a single coat. Use enough to wet the surface without creating drips, puddles or rundown. Do not over apply. Test for application rate.
- H. Protect treated surfaces from rainfall for a minimum of six hours following treatment.

3.15 CLEANING

- A. Immediately remove stains, efflorescence, or other excess resulting from the work of this section.
- B. Remove excess mortar, smears, and droppings as work proceeds and upon completion.
- C. Clean surrounding surfaces.

D. Clean all windows after all work is completed.

END OF SECTION

**SECTION 04 4313
STONE MASONRY VENEER**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cut stone veneer where shown on drawings.
- B. Trim panels, including headers, bands, copings, sills, and other stone shapes shown on drawings.
- C. Metal anchors and accessories.
- D. Setting mortar.

1.02 RELATED REQUIREMENTS

- A. Section 04 0100 – Maintenance of Masonry.
- B. Section 07 9200 – Joint Sealants.

1.03 SUBMITTALS

- A. See Division One for submittal procedures.
- B. Product Data: Provide data on stone units and mortar.
- C. Shop Drawings: Detailed sections and elevations for each profile to be replaced.
- D. Samples: Submit two stone samples illustrating color range, texture, and markings.

1.04 QUALITY ASSURANCE

- A. Stone Fabricator Qualifications: Company specializing in fabricating cut stone with minimum ten years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type required by this section, with minimum five years of experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect stone from discoloration during storage on site.
- B. Provide ventilation to prevent condensation from forming on stone.

1.06 FIELD CONDITIONS

- A. Cold Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

PART 2 PRODUCTS

2.01 STONE

- A. Cut Limestone: Indiana Oolitic Limestone; complying with ASTM C568/C568M Classification II - Medium Density.
 - 1. Grade: ILI Select.
 - 2. Color: Grey.
 - 3. Finish: Match adjacent existing.
 - 4. Special Shapes and Custom Sizes: As shown on drawings.

2.02 MORTAR

- A. Mortar: As specified in Section 04 0100 Maintenance of Masonry.

2.03 ACCESSORIES

- A. Anchors in Direct Contact with Stone: ASTM A666 Type 304, stainless steel, of sizes and configurations required for support of stone and applicable superimposed loads.
- B. Setting Buttons and Shims: Plastic.
- C. Elastomeric Setting Pads:

1. Product Quality Standard: AASHTO M 251.
 2. Minimum Physical Properties:
 - a. Hardness: 50 to 70 Shore, Type A durometer according to ASTM D 2240.
 - b. Tensile Strength: Not less than 2,250 psi according to ASTM D 412.
 3. Description: Plain, vulcanized, 100 percent polychloroprene (neoprene) elastomer, molded to size or cut from a molded sheet
- D. Pin Grommets: Rubber or neoprene of diameter required for pin and wall thickness to accommodate differential volumetric expansion of limestone.
- E. Flashings: See Section 04 0100.
- F. Weep/Cavity Vents: See Section 04 0100.
- G. Cleaning Solution: Type that will not harm stone, joint materials, or adjacent surfaces.

2.04 STONE FABRICATION

- A. Fabrication Quality Standards: In addition to standards specified elsewhere, comply with following, unless otherwise specified:
1. ASTM C 1242.
 2. ILI - Indiana Limestone Handbook.
 3. Approved submittals.
- B. Limestone Quarry:
1. Quarry limestone in contiguously extracted, matching blocks from a single bed of quarry stratum in a manner to ensure fabricated limestone will match approved submittals; fabrication from random sequence of blocks not permitted.
 2. Inspect quarried blocks and reject blocks with cracks extending through block.
- C. Fabrication Plant:
1. Inspect limestone for compliance with requirements for appearance, material, and fabrication. Replace defective panels.
 2. Grade and mark limestone for overall uniform appearance when assembled in place. Natural variations in appearance are acceptable if installed limestone panels match range of colors and other appearance characteristics represented in approved samples.
 3. Limestone panels with cracks shall not be used except for cutting out smaller panels without cracks.
- D. Fabricating Limestone: Fabricate in a manner to ensure limestone will match approved submittals.
1. Selection: Select limestone for fabrication that complies with following:
 - a. Pre-construction testing.
 - b. Fabricator's quality control inspections.
 - c. Production flexural strength testing.
 2. Panel Identification:
 - a. Mark limestone panels, on surface that will be concealed after installation, with designations used on approved shop drawings to identify individual limestone panels.
 - b. Orient markings on vertical panels so that they are right side up when panels are installed.
 3. Cutting, Sawing, and Drilling:

- a. Control depth of limestone and back check to maintain minimum clearance of not less than 1 inch between backs of limestone panels and other substrates behind limestone.
 - b. Make sizes, shapes, grain drift, and finishes required to comply with requirements indicated without cracks, broken corners, chipped edges, or other defects.
 - c. Shape to produce joints uniform in width.
 - d. Mortise and drill sinkages, rabbets, and holes for anchors, dowels, fasteners, supports, and lifting devices.
 - e. For square edges, cut straight, true, and at right angle to face; unless otherwise indicated, finish edge to match exposed face.
 - f. For quirk-miter corners, unless otherwise indicated, provide for cramp anchorage in top and bottom bed joints.
 - g. Make arises straight, sharp, true, and continuous at joints.
 - h. Cut kerfs so that dead load of limestone will be isolated from metal surfaces by not less than 1/16 inch; nibs or bulbs not allowed on kerf legs.
 - i. Form reveals, reglets, openings and other features.
- 4. Liner Blocks: Include pins and other anchorage devices in addition to adhesive.
 - 5. Contiguous Work: Provide chases, reveals, reglets, openings, and similar features as required to accommodate contiguous work.
 - 6. Tolerances: According to ILI - Indiana Limestone Handbook.
- E. Fabricate for 3/8 inch beds and joints.
 - F. Bed and Joint Surfaces: Cut or sawn full square for full thickness of unit.
 - G. Backs: Sawn.
 - H. Slope exposed top surfaces of stone and horizontal sill surfaces for shedding water.
 - I. Cut drip slot in bottom surface of work projecting more than 1/2 inch over window frame. Size slot not less than 3/8 inch wide and 1/4 inch deep for full width of projection.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates for compliance with requirements, installation tolerances and other conditions affecting performance.
- B. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents.
- C. Starting work within a particular area will be construed as acceptance.
- D. Verify that support work and site conditions are ready to receive work of this section.
- E. Verify that items built-in under other sections are properly located and sized.

3.02 PREPARATION

- A. Establish lines, levels, and coursing. Protect from disturbance.
- B. Substrate Cleaning: Remove defects or deficiencies that would result in poor or potentially defective installation of limestone cladding, or, that would cause latent defects in work.
- C. Clean stone prior to installation: Clean dirty or stained limestone surfaces by removing soil, stains, and foreign materials before setting. Do not use wire brushes or implements that mark or damage exposed surfaces
- D. Clean sawn surfaces of rust stains and iron particles.

3.03 INSTALLATION

- A. Installation Quality Standards: In addition to standards specified elsewhere, perform work according to following, unless otherwise specified:
 - 1. ASTM C 1242.
 - 2. ILI - Indiana Limestone Handbook.
 - 3. Approved submittals
- B. Size stone units to fit opening dimensions and perimeter conditions.
- C. Wet absorptive stone in preparation for placement to minimize moisture suction from mortar.
- D. Arrange stone pattern to provide color uniformity, minimize visual variations, and to provide a uniform blend of stone unit sizes.
- E. Provide setting and pointing mortar in accordance with Section 04 0100.
 - 1. If water is lost by evaporation, re-temper mortar only within two hours after mixing.
 - 2. At ambient air temperature 80 degrees F and above, use mortar within two hours after mixing; at ambient air temperature below 50 degrees F, use mortar within two-and-one-half hours after mixing.
- F. Fill dowel holes in stone units with mortar.
- G. Arrange stone coursing with consistent joint width.
- H. Set stone in full mortar setting bed to fully support stone over bearing surface. Use setting buttons or shims to maintain correct joint width.
- I. Install weep/cavity vents in vertical stone joints at 16-inches on center horizontally; immediately above horizontal flashings and above shelf angles and supports; do not permit mortar accumulation in cavity space.
- J. Cutting and Trimming: Saw-Cut Surfaces: Use power saws to cut limestone that is fabricated with saw-cut surfaces. Cut lines straight and true, with edges eased slightly to prevent snipping.
- K. Steel Loose Lintels: Set where indicated or required with not less than 8 inches of bearing at each jamb, unless otherwise indicated.
- L. Locate shims so point loading does not adversely affect limestone performance.
- M. Shim and adjust anchors, supports, and accessories to set limestone accurately in locations indicated.

3.04 JOINTS

- A. Leave the following joints open for sealant; see Section 07 9200:
 - 1. Wash joints and head joints in top courses, including copings, parapets, cornices, sills, and steps.
 - 2. Wash joints and head joints in projecting units.
 - 3. Joints between stone and dis-similar materials.
 - 4. Joints below ledge and relieving angles.
 - 5. Joints labeled "expansion joint" or "control joint".
- B. Rake out mortar joints 5/8 to 3/4 inch and brush joints clean to accommodate pointing mortar. Fill joints with pointing mortar.
- C. Pack mortar into joints and work into voids. Neatly tool surface to concave joint.
- D. At joints to be sealed, clean mortar out of joint before it sets. Brush joints clean.

3.05 CLEANING

- A. Remove excess mortar as work progresses, and upon completion of work.
- B. Replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution.

- D. Use non-metallic tools in cleaning operations.

3.06 PROTECTION

- A. During temporary storage on site, at the end of working day, and during rainy weather, cover stone work exposed to weather with non-staining waterproof coverings, securely anchored.

END OF SECTION

SECTION 05 5000
METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Shop fabricated steel items.

1.02 SUBMITTALS

- A. See Division One for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.
- D. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Steel Angles and Plates: ASTM A36/A36M.
- B. Bolts, Nuts, and Washers: ASTM A325 (ASTM A325M), Type 1, plain.
- C. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- D. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- E. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Continuously seal joined members by continuous welds.
- D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- E. Finish Exterior Items And Other Items Designated To Be Galvanized: Galvanize after fabrication accordance with requirements of ASTM A123/A123M, Grade 75, 1.75 oz/sq. ft. galvanized coating, minimum.
 - 1. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic.
- F. Prime Paint Non- Galvanized Items: Two coats SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- G. Welded Joints:
 - 1. Exterior Components: Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
 - 2. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

2.03 FABRICATED ITEMS

- A. Lintels: ASTM A36/A36M steel angle as detailed; galvanized finish.

2.04 FINISHES - STEEL

- A. Prepare surfaces to be primed in accordance with SSPC-SP2.
- B. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- C. Galvanizing of structural and non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.

2.05 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components indicated on drawings.
- D. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not galvanized.

3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

**SECTION 05 7000
DECORATIVE METAL**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Railing and guardrail assemblies.
- B. Free-standing railings at steps.

1.02 RELATED REQUIREMENTS

- A. Section 09 9000 Painting and Coating.

1.03 QUALITY CONTROL

- A. Fabricator Qualifications: Company specializing in fabricating railings with minimum five years of documented experience.
- B. Delegated Engineering Professional Qualifications:
 - 1. Professional engineer legally authorized to practice in jurisdiction where Project is located.
 - 2. Experienced in providing engineering services of kind indicated resulting in installations of railings similar to this Project in material, design, and extent.

1.04 DELEGATED ENGINEERING REQUIREMENTS

- A. Contract Documents: Concept of work specified by this Section is expressed on Drawings and in Specifications however, they may not indicate or specify full extent of work that may be required.
- B. Delegated Engineering Responsibility: Employ delegated engineering professional to provide engineering for each member and component of railing systems required to meet concept expressed in Contract Documents that includes, but is not limited to, following:
 - 1. Engineering to withstand structural design loads within limits and under conditions indicated, specified, or required, without material failure or permanent deformation of building structural frame or work specified according to following:
 - a. Applicable local building codes.
 - b. Criteria indicated in Contract Documents.
 - 2. Comprehensive engineering analysis indicating location, type, magnitude, and direction of loads imposed on building structure.
 - 3. Preparation of engineering calculations, shop drawings, and other submittals with professional seal affixed according to respective jurisdictional licensing regulations.

1.05 SUBMITTALS

- A. See Division One for submittal procedures.
- B. Product Data: Submit manufacturer's product data, including description of materials, components, finishes, fabrication details, anchors, and accessories.
- C. Shop Drawings: Indicate railing system elevations and sections, details of profile, dimensions, sizes, connection attachments, anchorage, size and type of fasteners, and accessories. Indicate anchor and joint locations, transitions, and terminations.
 - 1. Seal of delegated engineering professional.
- D. Structural attachments including following:
 - 1. Direction and working stresses of loads imposed by anchors, fasteners, and attachment devices.
 - 2. Direction and working stresses of each movement type specified under delegated engineering and performance requirements.

3. For anchors and fasteners, manufacturers, products, types, sizes, lengths, spacings, embedment, and edge distances of attachment devices.
4. Loose, cast-in, and field-set hardware, inserts, and connections.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in factory-provided protective coverings and packaging.
- B. Protect materials against damage during transit, delivery, storage, and installation at site.
- C. Inspect materials upon delivery for damage. Repair damage to be indistinguishable from undamaged areas; if damage cannot be repaired to be indistinguishable from undamaged parts and finishes, replace damaged items.
- D. Prior to installation, store materials and components under cover in a dry location.

PART 2 PRODUCTS

2.01 RAILING SYSTEMS

- A. Railing Systems - General: Shop-fabricated in design indicated, to suit specific project conditions, and for proper connection to building structure, and in largest practical sizes for delivery to site.
 1. Performance Requirements: Design and fabricate railings and anchorages to resist the following loads without failure, damage, or permanent set; loads do not need to be applied simultaneously.
 - a. Lateral Force: 75 lb minimum, at any point, when tested in accordance with ASTM E935.
 - b. Distributed Load: 50 lb/ft minimum, applied in any direction at the top of the handrail, when tested in accordance with ASTM E935.
 - c. Concentrated Loads on Intermediate Rails: 50 psf, minimum.
 - d. Concentrated Load: 200 lbs minimum, applied in any direction at any point along the handrail system, when tested in accordance with ASTM E935.
 - e. Handrails: Comply with applicable accessibility requirements of ADA Standards.
 2. Assembly: Join lengths, seal open ends, and conceal exposed mounting bolts and nuts using slip-on non-weld mechanical fittings, flanges, escutcheons, and wall brackets.
 3. Joints: Tightly fitted and secured, machined smooth with hairline seams.
 4. Field Connections: Provide sleeves to accommodate site assembly and installation.
 5. Anchors and Fasteners: Provide anchors and other materials as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
 - a. For anchorage to concrete, provide inserts to be cast into concrete for bolt anchors.
 - b. For anchorage to masonry, provide brackets to be embedded in masonry for bolt anchors.
 - c. Exposed Fasteners: Stainless Steel.
- B. Finishing:
 1. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
 2. Galvanize after fabrication in accordance with requirements of ASTM A123/A123M, Grade 75, 1.75 oz/sq. ft. galvanized coating, minimum.
 - a. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I – Inorganic.

2.02 MATERIALS

- A. Steel Components:
 1. Sections, Shapes, Plate and Bar: ASTM A29.
 2. Ungalvanized Steel Sheet: Hot- or cold-rolled, except use cold-rolled where finished work will be exposed to view.
 - a. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Designation CS (commercial steel).
 - b. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Designation CS (commercial steel).
 3. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

2.03 ACCESSORIES

- A. Welding Fittings: Shop-welded from matching pipe or tube; joints and seams ground smooth.
- B. Anchors and Fasteners: Provide anchors and other materials as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
 - 1. For anchorage to concrete, provide inserts to be cast into concrete for bolt anchors.
 - 2. For anchorage to masonry, provide brackets to be embedded in masonry for bolt anchors.
 - 3. Exposed Fasteners: Stainless Steel.
- C. Carbon Steel Bolts and Nuts: ASTM A307.
- D. Bituminous Coating: Cold-applied asphalt mastic, noncorrosive compound free of asbestos, sulfur, and other deleterious impurities; 0.015 inch dry film thickness per coat.

2.04 FABRICATION

- A. Accurately form components to suit specific project conditions and for proper connection to building structure.
- B. Fit and shop assemble components in largest practical sizes for delivery to site.
- C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.
- D. Grind, file and sand as required to remove all rough, un-even, sharp protrusions such as weld splatter, deleterious matter from hot dip galvanizing operations or other inconsistencies as required to provide a smooth surface on rails. Coordinate with Section 09 90 00, Painting and Coating.
- E. Welded Joints:
 - 1. Exterior Components: Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
 - 2. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate and site conditions are acceptable and ready to receive work.
- B. Verify field dimensions of locations and areas to receive work.
- C. Notify Architect immediately of conditions that would prevent satisfactory installation.
- D. Do not proceed with work until detrimental conditions have been corrected.
- E. Furnish components to be installed in other work to installer of that other work, including but not limited to blocking, sleeves, inserts, anchor bolts, embedded plates, and supports for attachment of anchors.

3.02 INSTALLATION

- A. Comply with manufacturer's drawings and written instructions.
- B. Install components plumb and level, accurately fitted, free from distortion or defects, and with tight joints, except where necessary for expansion.
- C. Anchor securely to structure.
- D. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.
- E. Isolate dissimilar materials with bituminous coating, bushings, grommets, or washers to prevent electrolytic corrosion.

3.03 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

3.04 PROTECTION

- A. Protect installed components and finishes from damage after installation.
- B. Repair damage to exposed finishes to be indistinguishable from undamaged areas.
 - 1. If damage to finishes and components cannot be repaired to be indistinguishable from undamaged finishes and components, replace damaged items.

END OF SECTION

**SECTION 06 1000
ROUGH CARPENTRY**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concealed wood blocking, nailers, and supports.

1.02 SUBMITTALS

- A. See Division One for submittal procedures.
- B. Product Data: Provide technical data on wood preservative materials.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
 - 1. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
 - 2. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

- A. Grading Agencies:
 - 1. Southern Pine Inspection Bureau, Inc; SPIB.
 - 2. West Coast Lumber Inspection Bureau; WCLIB.
 - 3. Western Wood Products Association; WWPA.
- B. Sizes: Nominal sizes as indicated on drawings, S4S.
- C. Moisture Content: S-dry or MC19.
- D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
 - 1. Lumber: S4S, No.2 or Standard Grade.
 - 2. Boards: Standard or No.3.

2.03 ACCESSORIES

- A. Fasteners and Anchors:
 - 1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.

2.04 FACTORY WOOD TREATMENT

- A. Treated Lumber and Plywood: Comply with requirements of AWWA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
 - 1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

- A. Select material sizes to minimize waste.
- B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including shims, bracing, and blocking.

3.02 Cleaning

- A. Waste Disposal:
 - 1. Comply with applicable regulations.
 - 2. Do not burn scraps that have been pressure-treated.
- B. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

**SECTION 06 2000
FINISH CARPENTRY**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Finish carpentry items.
- B. Wood casings and moldings.
- C. Solid Surface Window Stools and Aprons.

1.02 SUBMITTALS

- A. See Division One for submittal procedures.
- B. Product Data: Solid Surface.
- C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
 - 1. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).

1.03 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Store finish carpentry items under cover, elevated above grade, and in a dry, well-ventilated area not exposed to heat or sunlight.
- B. Protect from moisture damage.
- C. Handle materials and products to prevent damage to edges, ends, or surfaces.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

- A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
- B. Interior Woodwork Items:
 - 1. Moldings, Bases, Casings, and Miscellaneous Trim: Clear white pine; prepare for transparent finish.

2.02 WINDOW STOOLS AND APRONS

- A. Solid surfacing sheet over continuous substrate for window stools and aprons.
 - 1. Flat Sheet Thickness: 1/2 inch minimum shown on drawings.
 - 2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
 - a. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
 - 3. Material.
 - a. Finish on Exposed Surfaces: Semi-gloss, gloss rating of 25 to 50.
 - b. Color and Pattern: As selected by Architect from manufacturer's full line.
 - c. Manufacturers:
 - 1) Basis of Design: Wilsonart International, Inc.: www.wilsonart.com.
 - 2) Avonite Surfaces: www.avonitesurfaces.com.
 - 3) Formica Corporation: www.formica.com.

- 4) Substitutions: See Division One.
- 4. Other Components Thickness: thickness in inch's, minimum shown on drawings.
- 5. Exposed Edge Treatment: Built up to minimum 1-1/4 inch thick; Profile as indicated on drawings.
- 6. Fabricate in accordance with manufacturer's standard requirements.

2.03 ACCESSORIES

- A. Wood Filler: Solvent base, tinted to match surface finish color.
- B. Adhesive: Type recommended by AWI/AWMAC to suit application.
- C. Fasteners: Size and type to suit application.

2.04 FABRICATION

- A. Shop assemble work for delivery to site, permitting passage through building openings.
- B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
- C. Fabricate solid surface window stools and aprons in accordance with manufacturers instructions and consistent with drawings for profiles, thickness, and details

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install custom fabrications in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.
- B. Set and secure materials and components in place, plumb and level.
- C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.
- D. Install solid surface window stools and aprons in accordance with manufacturers instructions and consistent with drawings for profiles, thickness and details.

3.02 PREPARATION FOR SITE FINISHING

- A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.
- B. Site Finishing: See Section 09 9000.
- C. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

3.03 TOLERANCES

- A. Maximum Variation from True Position: 1/16 inch.
- B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION

**SECTION 07 1400
FLUID-APPLIED WATERPROOFING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cold-applied polyurethane-methacrylate (PUMA) waterproofing system.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete

1.03 SUBMITTALS

- A. See Division One for submittal procedures.
- B. Product Data: Provide data for membrane, surface conditioner, flexible flashings, and joint and crack sealants.
- C. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and acceptable installation temperatures.

1.04 FIELD CONDITIONS

- A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application and until cured.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Cold-Applied Polyurethane-Methacrylate (PUMA) Waterproofing System:
 - 1. Basis-of-Design:
 - a. Tremco Commercial Sealants & Waterproofing; TREMproof PUMA Below-Grade Membrane: www.tremcosealants.com.
 - 2. Other Manufacturers:
 - a. CETCO, a division of Minerals Technologies Inc; www.mineralstech.com.
 - b. Henry Company; www.henry.com.
 - c. Substitutions: See Division One.

2.02 FLUID-APPLIED WATERPROOFING APPLICATIONS

- A. Cold-Applied Polyurethane-Methacrylate (PUMA) Waterproofing System:
 - 1. Location: Between new concrete east entry stair and existing concrete slab below.

2.03 FLUID-APPLIED WATERPROOFING MATERIALS

- A. Cold-Applied Polyurethane-Methacrylate (PUMA) Waterproofing System: Consists of a primer and base coat.
 - 1. Application: Waterproofing concrete slabs.
 - 2. Cured Thickness: 97 mil, 0.097 inch, minimum, with applied base coat.
 - 3. Suitable for installation over concrete substrates properly prepared in accordance with manufacturers requirements.
 - 4. Primer: Two-component, methyl-methacrylate (MMA) based.
 - 5. Base Coat: Modified polyurethane-methacrylate (PUMA) based that bonds firmly to primer.
 - a. Elongation: 407 percent, minimum, measured in accordance with ASTM D638.
 - b. Tensile Strength: 1,680 psi, minimum, at 75 degrees F, measured in accordance with ASTM D638.
 - c. Durometer Hardness, Type D: 35, minimum, measured in accordance with ASTM D2240.
 - 6. Products:
 - a. Basis-of-Design: Tremco Commercial Sealants & Waterproofing; TREMproof PUMA BC: www.tremcosealants.com.
 - b. Substitutions: See Division One.

2.04 ACCESSORIES

- A. Substrate Patching Material: Trowel-grade; type compatible with waterproofing material and as recommended by waterproofing manufacturer
- B. Sealant for Joints and Cracks in Substrate: Type compatible with waterproofing material and as recommended by waterproofing manufacturer.
- C. Protection Mat: Polyester mat at least 14 oz/sq yd to protect vertical or horizontal waterproofing membranes.
 - 1. Thickness: 100 mil, 0.10 inch, minimum.
 - 2. Width: 40 inches.
 - 3. Products:
 - a. Tremco Commercial Sealants & Waterproofing; Tremco Protection Mat: www.tremcosealants.com.
 - b. Substitutions: See Division One.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify substrate surfaces are free of frozen matter, dampness, loose particles, cracks, pits, projections, penetrations, or foreign matter detrimental to adhesion or application of waterproofing system.
- C. Verify that substrate surfaces are smooth, free of honeycomb or pitting, and not detrimental to full contact bond of waterproofing materials.
- D. Verify that items penetrating surfaces to receive waterproofing are securely installed.
- E. Where existing conditions are responsibility of another installer, notify Architect of unsatisfactory conditions.
- F. Do not proceed with this work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Protect adjacent surfaces from damage not designated to receive waterproofing.
- B. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions; vacuum substrate clean.
- C. Do not apply waterproofing to surfaces unacceptable to waterproofing manufacturer.
- D. Fill non-moving joints and cracks with a filler compatible with waterproofing materials.
- E. Seal moving cracks with sealant and non-rigid filler, using procedures recommended by sealant and waterproofing manufacturers.

3.03 INSTALLATION

- A. Install waterproofing to specified minimum thickness in accordance with manufacturers instructions and NRCA (WM) applicable requirements.
- B. Apply primer or surface conditioner at a rate recommended by manufacturer, and protect conditioner from rain or frost until dry.
- C. Apply extra thickness of waterproofing material at corners, intersections, and angles.

3.04 PROTECTION

- A. Clean spills, stains, and overspray resulting from application - utilizing cleaning agents recommended by manufacturers of affected construction. Remove masking materials
- B. Protect waterproofing from damage from subsequent work. Protect waterproofing materials from exposure to UV light for period in excess of that acceptable to waterproofing manufacturer; replace overexposed materials and retest.
- C. Do not permit traffic over unprotected or uncovered membrane.

END OF SECTION

SECTION 07 4112 METAL SOFFIT PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Architectural soffit systems of preformed steel panels.

1.02 SUBMITTALS

- A. See Division One for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Storage and handling requirements and recommendations.
 - 2. Installation methods.
 - 3. Specimen warranty.
- C. Shop Drawings: Include layouts of soffit panels, details of edge and penetration conditions, spacing and type of connections, flashings, and special conditions.
 - 1. Show work to be field-fabricated or field-assembled.
- D. Selection Samples: For each system specified, submit color chips representing manufacturer's full range of available colors and patterns..
- E. Warranty: Submit specified manufacturer's warranty and ensure that forms have been completed in Owner's name and are registered with manufacturer.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Store panels on project site as recommended by manufacturer to minimize damage to panels prior to installation.

1.04 WARRANTY

- A. Finish Warranty: Provide manufacturer's special warranty covering failure of factory-applied exterior finish on metal roof panels and agreeing to repair or replace panels that show evidence of finish degradation, including significant fading, chalking, cracking, or peeling within specified warranty period of five years from Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Metal Soffit Panels:
 - 1. Basis of Design: Berridge Manufacturing Company; FW-12 with 4" o.c. Vee Groove, vented: www.berridge.com.
 - 2. Holcim Elevate: <https://www.holcimelevate.com>.
 - 3. Metal Roofing Systems: www.metalroofingsystems.biz.
 - 4. Substitutions: See Division One.

2.02 SOFFIT PANELS

- A. Metal Soffit Panels:
 - 1. Profile: Style as indicated, with venting provided.
 - 2. Material: Precoated steel sheet, 24 gauge.
 - 3. Color: As selected by Architect from manufacturer's standard line.

2.03 ATTACHMENT SYSTEM

- A. Concealed System: Provide manufacturer's standard stainless steel or nylon-coated aluminum concealed anchor clips designed for specific roofing system and engineered to meet performance requirements, including anticipated thermal movement.

2.04 ACCESSORIES

- A. Miscellaneous Sheet Metal Items: Provide flashings, trim, moldings, and closure strips of the same material, thickness, and finish as used for the soffit panels. Items completely concealed after installation may optionally be made of stainless steel.
- B. Sealants:
 - 1. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.
 - 2. Concealed Sealant: Non-curing butyl sealant or tape sealant.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation of preformed metal soffit panels until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 INSTALLATION

- A. Overall: Install system in accordance with panel manufacturer's instructions and recommendations, as applicable to specific project conditions. Anchor all components of soffit system securely in place while allowing for thermal and structural movement.
 - 1. Install system with concealed clips and fasteners, except as otherwise recommended by manufacturer for specific circumstances.
 - 2. Minimize field cutting of panels. Where field cutting is absolutely required, use methods that will not distort panel profiles. Use of torches for field cutting is absolutely prohibited.

3.03 CLEANING

- A. Clean exposed sheet metal work at completion of installation. Remove grease and oil films, excess joint sealer, handling marks, and debris from installation, leaving the work clean and unmarked, free from dents, creases, waves, scratch marks, or other damage to the finish.

3.04 PROTECTION

- A. Touch-up, repair, or replace damaged panels or accessories before Date of Substantial Completion.

END OF SECTION

SECTION 07 6200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fabricated sheet metal items, including flashing, counterflashing, and miscellaneous sheet metal items shown on drawings, not specified elsewhere.

1.02 REFERENCE STANDARDS

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2017a.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.
- C. SMACNA (ASMM) - Architectural Sheet Metal Manual 2012.

1.03 SUBMITTALS

- A. See Division One for submittal procedures.
- B. Product data.
- C. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
- D. Samples: Submit two sample sets 2x2 inch in size illustrating Manufacturer's full range of metal finish colors available.
- E. Sample Warranty: Submit sample of Manufacturer's standard 20 year finish warranty.

1.04 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA (ASMM) requirements and standard details, except as otherwise indicated.
- B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 5 years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

- A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24-gauge, (0.0239) inch thick base metal, shop pre-coated with PVDF coating.
 - 1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple-coat, thermally cured fluoropolymer finish system.
 - 2. Color: As selected by Architect from manufacturer's standard colors.

2.02 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Fabricate cleats of same material as sheet, minimum 4 inches wide, interlocking with sheet.
- C. Form pieces in longest possible lengths.
- D. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- E. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

- F. Joints and Seams: Use locks and seams recommended by appropriate SMACNA standard for item being joined. Set in compatible sealant as specified in Section 07 9200. Allow joint to move.
- G. Fabricate corners from one piece with minimum 18-inch-long legs; seam for rigidity, seal with sealant.
- H. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

2.03 ACCESSORIES

- A. Fasteners: Same material and finish as flashing metal, with soft neoprene washers.
- B. Underlayment: ASTM D226/D226M, organic roofing felt, Type II (No. 30).
- C. Primer: Zinc chromate type.
- D. Sealants - as specified in Section 07 9200:
 - 1. Type E1 for exposed sealants, color to match adjacent material.
 - 2. Type E2 for concealed sealants.
- E. Plastic Cement: ASTM D4586/D4586M, Type I.

PART 3 EXECUTION

3.01 PREPARATION

- A. Install starter strips, edge strips, and cleats before starting installation.
- B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil. Manufacturer's standard back paint on pre-finished sheet metal is acceptable in lieu of in-field back painting.

3.02 INSTALLATION

- A. Conform to drawing details and/or SMACNA standards, whichever is most stringent.
- B. Secure flashings in place using concealed cleats and fasteners, unless otherwise detailed.
- C. Apply plastic cement compound between metal flashings and felt flashings.
- D. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- E. Seal metal joints watertight with sealant specified in Section 07 9200.

END OF SECTION

SECTION 07 9200 JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Sealants, joint backings, bond breakers, and accessories.

1.02 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the work with other sections referencing this section.

1.03 SUBMITTALS

- A. See Division One for submittal procedures.
- B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
 - 1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
 - 2. List of backing materials approved for use with the specific product.
 - 3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
 - 4. Substrates the product should not be used on.
- C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
- D. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
- E. Manufacturer's Qualification Statement.
- F. Installer's Qualification Statement.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.

1.05 WARRANTY

- A. Correct defective work within a five-year period after Date of Substantial Completion.
- B. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

3.01 JOINT SEALANTS

- A. Type E-1 - General Purpose Exterior Sealant: Silicone Sealant; ASTM C920, Grade NS, Class 25; Uses M, G, A, O; single or multi-component, neutral-curing.
 - 1. Non-Staining to Porous Masonry: Non-staining when tested in accordance with ASTM C1248.
 - 2. Color: To be selected by Architect from manufacturer's standard range.
 - 3. Applications: Use for:
 - a. Joints between metal frames and other materials.
 - b. Control and soft joints in masonry.
 - c. Other exterior joints for which no other sealant is indicated.

- B. Type E-2 - Exterior Metal Lap Joint Sealant: Butyl or polyisobutylene; non-drying, non-skinning, non-curing.
 - 1. Applications: Use for:
 - a. Concealed sealant bead in sheet metal work.
- C. Type I-1 - General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, Type OP, Grade NF single component, paintable.
 - 1. Color: To be selected by Architect from manufacturer's standard range.
 - 2. Applications: Use for:
 - a. Interior wall and ceiling control joints.
 - b. Interior joints between door and window frames and wall surfaces.
 - c. Other interior joints for which no other type of sealant is indicated.

1.01 ACCESSORIES

- A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
 - 1. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.
- B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.
- C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.
- D. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.
- E. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 EXECUTION

2.01 EXAMINATION

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.

2.02 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

2.03 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
- D. Install bond breaker backing tape where backer rod cannot be used.
- E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

- F. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range or will be outside that range during the entire curing period, unless manufacturer's approval is obtained, and instructions are followed.
- G. Non-sag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

2.04 TESTING AND INSPECTION

- A. Furnish all labor and material to remove and replace sealant during on-site inspections by an independent testing agency furnished by the Owner as hereinafter specified.
 - 1. Upon completion of all sealant work on an elevation, cut and remove the sealant installed in joints at not to exceed 6 locations per side of building, approximately 1 lineal foot per location. The location(s) will be randomly selected by the independent testing agency.
 - 2. Coordinate removal of the sealant and backup material with independent testing agency. Work will be checked for compliance with the contract documents in accordance with ASTM C 1193.
 - 3. If defective work is found in any of the test locations, additional test sections may be required of the Contractor at no additional cost to the Owner.
 - 4. If defective work is found in any of the test locations, additional tests may be required of the contractor at no additional cost to the owner. If any test section removed reveals non-complying work, remove all adjacent sealant work to the point where work is found to comply. Re-seal in accordance with the contract documents. If all tests fail to meet the contract document requirements, the Contractor shall be required to re-seal the entire section of the building at no additional cost to the Owner.
 - 5. Provide lifts or other acceptable means of access to the work.

2.05 CLEANING

- A. Clean adjacent surfaces of excess sealant and smears as a result of this work, before the sealant cures.
- B. Repair joints that have shrunk, sagged, run, and/or that have thin spots or other defects.
- C. Leave adjacent surfaces in as good or better condition than they were before sealant operations.

2.06 PROTECTION

- A. Protect sealants until cured.

2.07 SCHEDULE

- A. See Drawings for designated sealant joints.
- B. Exterior joints for which no other sealant type is Indicated: Type E-1.
- C. Control and soft joints between masonry and adjacent work: Type E-1.
- D. Lap joints in exterior sheet metal work: Type E-2.
- E. Joints between exterior metal frames and adjacent work: Type E-1.
- F. Interior joints for which no other sealant is Indicated: Type I-1.

END OF SECTION

**SECTION 08 4313
ALUMINUM-FRAMED ENTRANCES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Aluminum-framed storefront, with vision glass.
- B. Aluminum doors and frames.
- C. Weatherstripping.
- D. Door hardware.

1.02 RELATED REQUIREMENTS

- A. Section 08 7100 – Door Hardware.
- B. Section 08 8000 – Glazing.

1.03 SUBMITTALS

- A. See Division One for submittal procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.
- D. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.
- E. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.
- F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.06 FIELD CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.07 WARRANTY

- A. See Division One for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

- D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Aluminum-Framed Storefronts Manufacturers:
1. EFCO Corporation; <https://www.efcocorp.com/>.
 2. Oldcastle Building Envelope: www.oldcastlebe.com/.
 3. Tubelite, Inc: www.tubeliteinc.com/.
 4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 BASIS OF DESIGN

- A. Framing:
1. EFCO Corporation; Series 403 T, Thermal Storefront Framing.
 2. Center-Set Style, Thermally-Broken.
 3. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.
- B. Swinging Doors:
1. EFCO Corporation; Series D518, Durastile Heavy Duty.
 2. Thickness: 2 inches.

2.03 ALUMINUM-FRAMED STOREFRONT

- A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
1. Glazing Rabbet: For 1 inch insulating glazing.
 2. Finish: Superior performing organic coatings.
 - a. Factory finish all surfaces that will be exposed in completed assemblies.
 - b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
 3. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
 4. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
 5. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
 6. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
 7. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
 8. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
- B. Performance Requirements
1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
 - a. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
 2. Air Leakage: 0.06 cfm/sq ft maximum leakage of storefront wall area when tested in accordance with ASTM E283/E283M at 1.57 psf pressure difference.

3. Air Leakage: 0.06 cfm/sq ft maximum leakage of storefront wall area when tested in accordance with ASTM E283/E283M at 1.57 psf pressure difference.

2.04 COMPONENTS

- A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
 1. Glazing Stops: Flush.
- B. Glazing: See Section 08 8000.
- C. Swing Doors: Glazed aluminum.
 1. Thickness: 2 inches.
 2. Top Rail: 5 inches wide.
 3. Vertical Stiles: 5 inches wide.
 4. Bottom Rail: 10 inches wide; single ADA bottom rail option.
 5. Glazing Stops: Square.
 6. Finish: Same as storefront.

2.05 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Fasteners: Stainless steel.
- C. Exposed (Break Metal) Flashings: 0.032 inch thick aluminum sheet; finish to match framing members.
- D. Perimeter Sealant: Type E1 as specified in Section 07 9200.
- E. Glass: As specified in Section 08 8000.
- F. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
- G. Glazing Accessories: As specified in Section 08 8000.

2.06 FINISHES

- A. Exterior: Superior Performance Organic Coating System: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system.
- B. Interior: High Performance Organic Finish: AAMA 2604; multiple coats, thermally cured fluoropolymer system..
- C. Apply 1 coat of bituminous coating to concealed aluminum surfaces in contact with dissimilar materials.
- D. Color: Custom color to match approved sample.

2.07 HARDWARE

- A. For each door, include weatherstripping, sill sweep strip, and threshold.
- B. Other Door Hardware: See Section 08 7100.
- C. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.
- D. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.
- E. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; provide on all doors.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.

- B. Verify that storefront wall openings and adjoining water-resistive and/or air barrier seal materials are ready to receive work of this section.

3.02 INSTALLATION

- A. Install wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
- H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- I. Set thresholds in bed of sealant and secure.
- J. Install hardware using templates provided.
 - 1. See Section 08 7100 for hardware installation requirements.
- K. Install glass and infill panels using glazing method required to achieve performance criteria; see Section 08 8000.
- L. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inch per 3 feet non-cumulative or 0.06 inch per 10 feet, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 ADJUSTING

- A. Adjust operating hardware and sash for smooth operation.

3.05 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths, and take care to remove dirt from corners and to wipe surfaces clean.

3.06 PROTECTION

- A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

SECTION 08 5113
ALUMINUM WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Extruded aluminum windows with operating sash.
- B. Factory glazing.
- C. Operating hardware.
- D. Insect screens.

1.02 RELATED REQUIREMENTS

- A. Section 08 8000 Glazing.

1.03 SUBMITTALS

- A. See Division One for Submittal Procedures.
- B. Product Data: Provide component dimensions, information on glass and glazing, internal drainage details, and descriptions of hardware and accessories.
- C. Shop Drawings: Indicate opening dimensions, elevations of different types, framed opening tolerances, method for achieving air and vapor barrier seal to adjacent construction, anchorage locations, panning details, and installation requirements.
- D. Manufacturer's Installation Instructions: Include complete preparation, installation, and cleaning requirements.
- E. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.
- F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of AAMA CW-10.
- B. Protect finished surfaces with wrapping paper or strippable coating during installation. Do not use adhesive papers or sprayed coatings that bond to substrate when exposed to sunlight or weather.

1.06 FIELD CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40 degrees F.
- B. Maintain this minimum temperature during and 24 hours after installation of sealants.

1.07 WARRANTY

- A. Correct defective Work within a five year period after Date of Substantial Completion.
- B. Provide five-year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
- C. Provide twenty-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Quaker Commercial Windows and Doors; Model H650 SH;
www.quakercommercialwindows.com.
- B. Other Acceptable - Aluminum Windows Manufacturers:
 - 1. EFCO Corporation: www.efcocorp.com.
 - 2. TRACO: www.traco.com.
 - 3. Substitutions: See Division One.

2.02 ALUMINUM WINDOWS

- A. Aluminum Windows: Extruded aluminum frame and sash, factory fabricated, factory finished, with operating hardware, related flashings, and anchorage and attachment devices.
 - 1. Performance Class: AW.
 - 2. Performance Grade: PG50.
 - 3. Frame Depth: 4-1/8 inch.
 - 4. Operable Units: Double weatherstripped.
 - 5. Provide units factory glazed.
 - 6. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for operating hardware and imposed loads.
 - 7. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
 - 8. Movement: Accommodate movement between window and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
 - 9. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
- B. Single-Hung Type:
 - 1. Construction: Thermally broken.
 - 2. Provide screens.
 - 3. Glazing: Double; clear; low-e.
 - a. Section 08 8000: Type IG-1.
 - b. Section 08 8000: Type Acid-Etched IG-1 at "frosted" windows.
 - 4. Exterior and Interior Finish:
 - a. Superior Performance Organic Powder Coating conforming to AAMA 2605.
 - b. Color: As selected by Architect from manufacturer's full range.

2.03 COMPONENTS

- A. Insect Screens: Extruded aluminum frame with mitered and reinforced corners; screen mesh taut and secure to frame; secured to window with adjustable hardware allowing screen removal without use of tools.
 - 1. Screen Mesh: Vinyl-coated fiberglass, window manufacturer's standard mesh.
 - 2. Frame Finish: Same as frame and sash.
- B. Operable Sash Weatherstripping: Wool pile; permanently resilient, profiled to achieve effective weather seal.
- C. Fasteners: Stainless steel.
- D. Sealant for Setting Sills and Sill Flashing: Non-curing butyl type.
- E. Panning: Provide at all heads, jambs, and sills to match profiles as indicated on drawings.

- F. Decorative Lugs:
 - 1. Provide decorative applied lugs underneath vertical rails of upper window sash.
 - 2. 'Ogee'-shaped, as indicated on drawings.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that wall openings and adjoining air and vapor seal materials are ready to receive aluminum windows.

3.02 INSTALLATION

- A. Install windows in accordance with manufacturer's instructions.
- B. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.
- C. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.
- D. Install sill and sill end angles.
- E. Provide thermal isolation where components penetrate or disrupt building insulation. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- F. Install perimeter sealant in accordance with requirements specified in Section 07 9200.

3.03 ADJUSTING

- A. Adjust hardware for smooth operation and secure weathertight closure.

3.04 FIELD QUALITY CONTROL

- A. The Owner will retain an independent testing agency to test 3- installed windows in accordance with AAMA 502, "Voluntary Specification for Field Testing of Windows and Sliding Glass Doors," using Test Method B.
- B. Air infiltration field tests shall be conducted at the same uniform static test pressure as the laboratory test unit. The Maximum allowable rate of air leakage shall not exceed 1.5 times the laboratory test unit for hardware and glazing types consistent with the laboratory test unit. Performance values may be reduced due to deviations from the laboratory test unit such as product size, configuration, hardware selected, and glazing configuration. The field test air leakage rate shall not exceed 1.5 times the maximum allowable laboratory performance specified in the testing criteria listed above for any configuration.
- C. Water penetration field tests shall be conducted at a static test pressure of 2/3 of the laboratory test performance values for hardware and glazing types consistent with the laboratory test unit. Performance values may be reduced due to deviations from the laboratory test unit such as product size, configuration, hardware selected, and glazing variations. The field test water test pressure shall not be less than 2/3 of the minimum allowable laboratory performance specified in the testing criteria listed above for any configuration.
- D. Replace windows that have failed field testing and retest until performance is satisfactory.

3.05 CLEANING

- A. Remove protective material from factory finished aluminum surfaces.
- B. Wash surfaces by method recommended and acceptable to window manufacturer; rinse and wipe surfaces clean.
- C. Remove excess glazing sealant by moderate use of mineral spirits or other solvent acceptable to sealant and window manufacturer.

3.06 SCHEDULE

A. See Drawings for Window Schedule.

END OF SECTION

SECTION 08 7100
DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Hardware for aluminum doors.
- B. Electrically operated and controlled hardware.

1.02 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.
- B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.
- C. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.
- D. Convey Owner's keying requirements to manufacturers.

1.03 SUBMITTALS

- A. See Division One for Submittal Procedures.
- B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.
- C. Shop Drawings - Door Hardware Schedule: Submit detailed listing that includes each item of hardware to be installed on each door. Use door numbering scheme as included in Contract Documents.
 - 1. Provide complete description for each door listed.
 - 2. Provide manufacturer's and product names, and catalog numbers; include functions, types, styles, sizes and finishes of each item.
 - 3. Include account of abbreviations and symbols used in schedule.
- D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- E. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- F. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.
- G. Keys: Deliver with identifying tags to Owner by security shipment direct from hardware supplier.
- H. Maintenance Materials and Tools: Furnish the following for Owner's use in maintenance of project.
 - 1. Tools: One set of each special wrench or tool applicable for each different or special hardware component, whether supplied by hardware component manufacturer or not.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified for commercial door hardware with at least three years of experience.

- C. Supplier Qualifications: Company specializing in supplying commercial door hardware with at least three years of experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Package hardware items individually; label and identify each package with door opening code to match door hardware schedule.

PART 2 PRODUCTS

2.01 DESIGN AND PERFORMANCE CRITERIA

- A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.
- B. Provide door hardware products that comply with the following requirements:
 - 1. Applicable provisions of federal, state, and local codes.
 - 2. Accessibility: ADA Standards and ICC A117.1.
 - 3. Applicable provisions of NFPA 101.
 - 4. Fire-Rated Doors: NFPA 80, listed and labeled by qualified testing agency for fire protection ratings indicated, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.
 - 5. Hardware on Fire-Rated Doors: Listed and classified by UL (DIR) as suitable for application indicated.
 - 6. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified.
- C. Electrically Operated and/or Controlled Hardware: Provide necessary power supplies, power transfer hinges, relays, and interfaces as required for proper operation; provide wiring between hardware and control components and to building power connection in compliance with NFPA 70.
- D. Finishes: Provide door hardware of the same finish unless otherwise indicated.
 - 1. Finish: Satin chrome plated over nickel on brass or bronze, 626 (approx. US26D).
- E. Provide non-removable pins (NRP) when hinges are exposed to the outside of a room with locking hardware or to the exterior of exterior doors.

2.02 KEYING

- A. Door Locks: Supply Best 7-Pin cores to Owner with 2 key blanks per core. Owner will do their own combining. Furnish construction cores until Owner installs permanent cores.

2.03 MANUFACTURERS

- A. Basis of Design manufacturers as listed below. Substitutions - See Division One.
- B. Hinges: Hager Full Mortise Hinges: BB-1168, 5" x 4-1/2;
www.hagerco.com.
- C. Exit Devices: Von Duprin EL 9947-NL-OP; www.vonduprin.com.
- D. Power Supply: Re-use existing.
- E. Power Transfer Devices: Von Duprin EPT-10; www.vonduprin.com.
- F. Door Position Switches: Schlage 7764 - Concealed, flush mount; www.schlage.com.
- F. Strikes: Von Duprin #299, Standard Rim Panic Strike; www.vonduprin.com.
- G. Closers: LCN 4040XP: www.lcnclosers.com.

- | | |
|----------------|--|
| H. Pulls: | Rockwell BF-158 – 1-inch diameter, 90-degree offset, 12" pull.
Through-bolt mounting with stainless steel screws:
www.assaabloydooraccessories.us . |
| I. Gasketing: | Manufacturer's Standard. |
| J. Thresholds: | Manufacturer's Standard. |
| K. Card Reader | By Owner. |

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames are properly installed, and dimensions are as indicated on shop drawings.
- B. Verify that electric power is available to power operated devices and of correct characteristics.

3.02 INSTALLATION

- A. Install hardware in accordance with manufacturer's instructions and applicable codes.
- B. Use templates provided by hardware item manufacturer.
- D. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.

3.03 ADJUSTING

- A. Adjust hardware for smooth operation.
- B. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

3.04 PROTECTION

- A. Protect finished work.
- B. Do not permit adjacent work to damage hardware or finish.

3.05 SCHEDULE

Hardware Group 1

Door 100 - Single Aluminum, Aluminum Frame, Exterior

3	Hinges	Hager BB1168, NRP, 5" x 4-1/2"
1	Strike	Von Duprin #299, Standard Rim Panic Strike
1	Power Supply	Re-use existing; provide new EPT-10 transfer device
1	Rim Exit Device	Von Duprin EL 9947-NL-OP-US26D
1	Pull	Rockwell BF-158 – 1-inch diameter, 90-degree offset, 12" pull
1	Closer	LCN 4040XP Top Jamb, mounted on interior
1	Cylinder	Must accept Best 7-Pin, SFI Cores; Owner will do their own combining.
1	Door Position Switch	Schlage 7764 - Concealed, flush mount
1	Threshold	By Entrance Manufacturer
	Perimeter Gasketing	By Entrance Manufacturer; Pile
1	Card Reader	Card reader and final connections furnished by Owner. Contractor shall provide all rough-in for card reader, including conduits, boxes and wiring. Provide coordination of all hardware and wiring to ensure compatibility with Owner's card access system. See electrical drawings for door control riser diagrams, electrical details, and card access details.

END OF SECTION

SECTION 08 8000 GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Insulating glass units.
- B. Glazing units.
- C. Glazing compounds.

1.02 SUBMITTALS

- A. See Division One for submittal procedures.
- B. Product Data on Insulating Glass Unit and Glazing Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
- C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
- D. Samples: Submit two samples 12 by 12 inch in size of glass units.
- E. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.03 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA (GM), GANA (SM), GANA (LGRM), and IGMA TM-3000 for glazing installation methods.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

1.04 FIELD CONDITIONS

- A. Do not install glazing when ambient temperature is less than 40 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.05 WARRANTY

- A. See Division One for additional warranty requirements.
- B. Insulating Glass Units: Provide a five (5) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Float Glass Manufacturers:
 - 1. AGC Glass North America, Inc: www.agcglass.com.
 - 2. Cardinal Glass Industries: www.cardinalcorp.com.
 - 3. Guardian Glass, LLC: www.guardianglass.com.
 - 4. Pilkington North America Inc: www.pilkington.com/na/.
 - 5. Substitutions: See Division One.

2.02 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

- A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.

1. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
 2. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
 3. Glass thicknesses listed are minimum.
- B. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
1. Center of Glass U-Value: Minimum 0.31. Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
 2. Center of Glass Solar Heat Gain Coefficient (SHGC): Minimum 0.37. Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
 3. Solar Optical Properties: Comply with NFRC 300 test method.

2.03 GLASS MATERIALS

- A. Float Glass: Provide float glass based glazing unless otherwise indicated.
1. Kind FT - Fully Tempered Type: Complies with ASTM C1048.
 2. Fully Tempered Safety Glass: Complies with ANSI Z97.1 or 16 CFR 1201 criteria for safety glazing used in hazardous locations.
 3. Thicknesses: As indicated; provide greater thickness as required for exterior glazing wind load design.

2.04 INSULATING GLASS UNITS

- A. Fabricator: Certified by glass manufacturer for type of glass, coating, and treatment involved and capable of providing specified warranty.
- B. Type IG-1 - Insulating Glass Units: Vision glass, double glazed.
1. Applications: Exterior glazing unless otherwise indicated.
 2. Space between lites filled with argon.
 3. Outboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 - b. Coating: Low-E (passive type), on #2 surface.
 4. Inboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 5. Total Thickness: 1 inch.
- C. Type Acid Etched IG-1 - Insulating Glass Units: Vision glass, double glazed.
1. Applications: Exterior glazing indicated as "Frosted White".
 2. Space between lites filled with argon.
 3. Outboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 - b. Coating: Low-E (passive type), on #2 surface.
 4. Inboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
 - a. Tint: Acid-Etched, Clear.
 5. Total Thickness: 1 inch.

2.05 GLAZING UNITS

- A. Type S1 – Single Safety Glazing; Non-fire-rated:
1. Applications: Glazed lites in doors, except fire doors.
 2. Glass Type: Fully tempered float glass.
 3. Tint: Clear.
 4. Thickness: 1/4 inch, nominal.

2.06 GLAZING COMPOUNDS

- A. Type GC-5 - Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, nonstaining; ASTM C920 Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.

2.07 ACCESSORIES

- A. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.
- B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.
- C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black color.
 - 1. Width: As required for application.
 - 2. Thickness: As required for application.
 - 3. Spacer Rod Diameter: As required for application.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

- A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.
- C. Verify that sealing between joints of glass framing members has been completed effectively.
- D. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

- A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.
- B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.
- C. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.

3.04 INSTALLATION - WET GLAZING METHOD (SEALANT AND SEALANT)

- A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.
- B. Place setting blocks at 1/4 points and install glazing pane or unit.
- C. Install removable stops with glazing centered in space by inserting spacer shims both sides at 24 inch intervals, 1/4 inch below sight line.

- D. Fill gaps between glazing and stops with Silicone type sealant to depth of bite on glazing, but not more than 3/8 inch below sight line to ensure full contact with glazing and continue the air and vapor seal.
- E. Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.05 CLEANING

- A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
- B. Remove non-permanent labels immediately after glazing installation is complete.
- C. Clean glass and adjacent surfaces after sealants are fully cured.
- D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.06 PROTECTION

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.
- B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION

SECTION 08 9100 LOUVERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Louvers, frames, and accessories.

1.02 SUBMITTALS

- A. See Division One for submittal procedures.
- B. Product Data: Provide data describing design characteristics, maximum recommended air velocity, design free area, materials, and finishes.
- C. Shop Drawings: Indicate louver plan and elevations, opening and clearance dimensions, and tolerances; head, jamb, and sill details; blade configuration, screens, and frames.
- D. Samples (louver): Submit two samples 2 by 2 inches in size illustrating finish and color of exterior surfaces.
- E. Test Reports: Independent agency reports showing compliance with specified performance criteria.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.03 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with minimum three years of documented experience.

1.04 WARRANTY

- A. Louvers: Provide five-year manufacturer's warranty against distortion, metal degradation, and connection failures of louver components.
 - 1. Finish: Include twenty-year coverage against degradation of exterior finish.
- B. See Division One for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Louvers:
 - 1. Basis-of-Design: Ruskin: www.ruskin.com.
 - a. See louver schedule on drawings for model number, type, and size.
 - 2. American Warming and Ventilating: www.awv.com.
 - 3. Pottorff: www.pottorff.com.
 - 4. Substitutions: See Division One.

2.02 LOUVERS

- A. Stationary Louvers: Factory fabricated and assembled, complete with frame, mullions, and accessories; AMCA Certified in accordance with AMCA 511.
 - 1. Horizontal blade, extruded aluminum construction; 6063T6 alloy.
 - 2. Wind Load Resistance: Design to resist positive and negative wind load of 30 psf without damage or permanent deformation.
 - 3. Free Area: 47 percent, minimum.
 - 4. Frame: Channel profile; corner joints mitered and with continuous recessed caulking channel each side.
 - 5. Aluminum Thickness: Frame 0.080 inch minimum; blades 0.060 inch minimum.
 - 6. Finish: Superior performing organic coatings; finish welded units after fabrication.
 - a. Superior Performing Organic Coatings System: Manufacturer's standard multi-coat superior performing organic coatings system complying with AAMA 2605, including at least 70 percent polyvinylidene fluoride (PVDF) resin, and at least 80 percent of

aluminum extrusion and panels surfaces having minimum total dry film thickness (DFT) of 1.2 mils, 0.0012 inch.

b. Color: Custom, to match approved sample.

7. Screens: Provide insect screens at intake louvers and bird screens at exhaust louvers.

2.03 ACCESSORIES

- A. Screens: Frame of same material as louver, with reinforced corners; removable, screw attached; installed on inside face of louver frame.
- B. Blank-Off Panels: Aluminum face and back sheets, polyisocyanurate foam core, 1-inch thick, painted black on exterior side; provide at locations shown on drawings to seal off louver area.
- C. Fasteners and Anchors: Stainless steel.
- D. Sealants: Type as specified in Section 07 9200.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that prepared openings and flashings are ready to receive this work, and opening dimensions are as indicated on shop drawings.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install louvers level, plumb, square, and free from racking.
- C. Align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.
- D. Secure louver frames in openings with concealed fasteners.

3.03 CLEANING

- A. Strip protective finish coverings.
- B. Clean surfaces and components.

END OF SECTION

**SECTION 09 2613
GYPSUM VENEER PLASTERING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Gypsum veneer plaster on masonry, concrete, existing plaster, and other substrates.

1.02 SUBMITTALS

- A. See Division One for Submittal Procedures.
- B. Product Data: Provide data on veneer plaster products.

1.03 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing the work of this section with minimum three years of experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Gypsum Veneer Plaster:
 - 1. Georgia-Pacific Gypsum LLC: www.buildgp.com/gypsum.
 - 2. Gold Bond Building Products, LLC: www.goldbondbuilding.com.
 - 3. USG: www.usg.com.
 - 4. Substitutions: See Division One.

2.02 MATERIALS

- A. Gypsum Veneer Plaster: ASTM C587, mixed in accordance with manufacturer's instructions.
- B. Thickness: Match existing; Plus or minus 1/64 inch.
- C. Bond Coat: ASTM C631, vinyl polymer type, bonding compound.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrates are ready to receive work.
- B. Verify masonry mortar joints are cut flush; verify surface is ready to receive work of this section. Verify no bituminous or water repellent coatings exist on masonry surface.
- C. Verify concrete surfaces are flat, honeycombs are filled flush, and surface is ready to receive work of this section. Verify no bituminous agents exist on concrete surfaces.

3.02 PREPARATION

- A. Clean surfaces of dust or loose matter.
- B. Remove projections greater than 1/8 inch and fill depressions greater than 1/4 inch with Portland cement mortar.
- C. Apply bond coat to prepare masonry surfaces within 24 hours of veneer plaster application. Apply in accordance with manufacturer's instructions.

3.03 INSTALLATION - VENEER PLASTER

- A. Install gypsum veneer plaster in accordance with ASTM C843 and manufacturer's instructions.
- B. Dampen masonry surfaces without leaving visible water on surface, to minimize suction from veneer plaster materials. Install veneer plaster immediately after dampening.
- C. Finish surface to flat, smooth, hard trowel finish.

3.04 PROTECTION

- A. Do not permit traffic near unprotected finished surfaces.

END OF SECTION

SECTION 095100
SUSPENDED ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Suspended metal grid ceiling system.
- B. Acoustical units.

1.02 SUBMITTALS

- A. See Division One for Submittal procedures.
- B. Product Data: Provide data on suspension system components and acoustical units.
- C. Samples: Submit two samples 4 x 4 inch in size, illustrating material and finish of acoustical units.
- D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. Extra Acoustical Units: Quantity equal to 5 percent of each type installed.

1.03 QUALITY ASSURANCE

- A. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.

1.03 FIELD CONDITIONS

- A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Armstrong World Industries, Inc: www.armstrongceilings.com.
- B. CertainTeed Corporation: www.certainteed.com/ceilings-and-walls.
- C. USG Corporation: www.usg.com/ceilings.

2.02 PRODUCTS

- A. Acoustic Panels:
 - 1. Basis-of-Design manufacturer, product, color, pattern, and locations shown in finish schedule on drawings.
 - 2. Substitutions: See Division One.
- B. Suspension Systems:
 - 1. Same as for acoustical units.

2.03 ACCESSORIES

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.
- B. Perimeter Moldings: Same material and finish as grid.
 - 1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.
- C. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C636/C636M and manufacturer's instructions and as supplemented in this section.
- B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- C. Locate system on room axis according to reflected plan.
- D. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
- E. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- H. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
- I. Do not eccentrically load system or induce rotation of runners.
- J. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 - 1. Use longest practical lengths.
 - 2. Miter corners.

3.03 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Fit border trim neatly against abutting surfaces.
- D. Install units after above-ceiling work is complete.
- E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- F. Cutting Acoustical Units:
 - 1. Make field cut edges of same profile as factory edges.
- G. Install hold-down clips on panels within 20 ft of an exterior door.

3.04 TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

3.05 SCHEDULE

- A. See finish schedule on drawings.

END OF SECTION

SECTION 09 6500
RESILIENT FLOORING AND BASE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Resilient tile flooring.
- B. Resilient base.
- C. Installation accessories.

1.02 SUBMITTALS

- A. See Division One for Submittal Procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Verification Samples: Submit two samples illustrating color and pattern for each resilient flooring product specified.
- D. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.03 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing specified flooring with minimum three years documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Protect materials from damage. Store materials according to manufacturer's recommendations.

1.05 FIELD CONDITIONS

- A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

PART 2 PRODUCTS

2.01 TILE FLOORING

- A. Vinyl Composition Tile: Homogeneous, with color extending throughout thickness.
 - 1. See finish schedule on drawings for basis-of-design manufacturer, product, color, and locations.
 - a. Substitutions: See Division One.
 - 2. Minimum Requirements: Comply with ASTM F1066, of Class corresponding to type specified.
 - 3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
 - 4. Size: 12 by 12 inch, to match existing.
 - 5. Color and Pattern: Match existing.
 - 6. Thickness: 0.125 inch.

2.02 RESILIENT BASE

- A. Resilient Base: ASTM F1861, Type TP, rubber, thermoplastic; top set Style B, Cove.
 - 1. Height: 4 inch.
 - 2. Thickness: 1/8 inch thick, minimum.
 - 3. Finish: Satin.
 - 4. See finish schedule on drawings for manufacturer, product, color, and locations.
 - a. Substitutions: See Division One.

2.04 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
- B. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.
- C. Sealer and Wax: Types recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.
- C. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).
 - 1. Test as Follows:
 - a. Alkalinity (pH): ASTM F710.
 - b. Internal Relative Humidity: ASTM F2170.
 - c. Moisture Vapor Emission: ASTM F1869..
 - 2. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
- D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

- A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- B. Remove subfloor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with subfloor filler to achieve smooth, flat, hard surface.
- C. Prohibit traffic until filler is fully cured.
- D. Clean substrate.
- E. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

3.03 INSTALLATION - GENERAL

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install in accordance with manufacturer's written instructions.
- C. Spread only enough adhesive to permit installation of materials before initial set.
- D. Fit joints and butt seams tightly.
- E. Set flooring in place, press with heavy roller to attain full adhesion.
- F. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.

- G. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.04 INSTALLATION – TILE FLOORING

- A. Lay flooring with joints and seams parallel to building lines to produce symmetrical pattern.

3.05 INSTALLATION - RESILIENT BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. Install base on solid backing. Bond tightly to wall and floor surfaces.
- C. Scribe and fit to door frames and other interruptions.

3.06 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean in accordance with manufacturer's written instructions.

3.08 PROTECTION

- A. Prohibit traffic on resilient flooring for 48 hours after installation.

3.09 SCHEDULE

- A. See finish schedule on drawings for manufacturer, product, locations, and colors.

END OF SECTION

**SECTION 09 9000
PAINTING AND COATING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. Specified testing of substrates.
- D. Scope: Finish surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
 - 1. Exterior Steel: Existing lintels, railings, and other items as noted.
 - 2. Interior wood trim at windows and doors.
 - 3. Interior wall surfaces where affected by scope of renovation.
 - 4. Mechanical and Electrical:
 - a. In finished areas, paint all insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
 - 5. All items noted on drawings to be painted.
- E. Do not paint or finish the following:
 - 1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
 - 5. Glass.
 - 6. Concealed pipes, ducts, and conduits.

1.02 SUBMITTALS

- A. See Division One for submittal procedures.
- B. Product Data: Provide complete list of products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
 - 2. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
 - 3. Manufacturer's installation instructions.
 - 4. If proposal of substitutions is allowed under submittal procedures, explanation of all substitutions proposed.
- C. Samples: Submit two paper draw down samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
- D. Certification: By manufacturer that paint and finishes comply with VOC limits specified.
- E. Certification: By manufacturer that all paints and coatings do not contain any of the prohibited chemicals specified; GreenSeal GS-11 certification is not required but if provided shall constitute acceptable certification.
- F. Results of all required testing.
- G. Manufacturer's Instructions: Indicate special surface preparation procedures and substrate conditions requiring special attention
- H. Maintenance Data: Submit coating maintenance manual including product technical data sheets, safety data sheets (SDS), care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.03 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum ten years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 3 years' experience.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, product name, product code, color designation, VOC content, batch date, environmental handling, surface preparation, application, and use instructions.
- C. Paint Materials: Store at a minimum of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.05 FIELD CONDITIONS

- A. Do not apply materials when environmental conditions are outside the ranges required by manufacturer.
- B. Follow manufacturer's recommended procedures for producing the best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
- E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide all paint and coating products used in any individual system from the same manufacturer, no exceptions.
- B. Basis of Design Products: Subject to compliance with requirements, provide Sherwin-Williams Company products as indicated; www.sherwin-williams.com.
 - 1. Other Acceptable Manufacturers:
 - a. PPG Paints: www.ppgpaints.com.
 - b. Behr Process Corporation: www.behr.com.
 - 2. Substitutions: See Division One.

2.02 PAINTINGS AND COATINGS

- A. General:
 - 1. Provide factory-mixed coatings unless otherwise indicated.
 - 2. Do not reduce, thin, or dilute coatings or add materials to coatings unless specifically indicated in manufacturer's instructions.
- B. Volatile Organic Compound (VOC) Content:
 - 1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - 2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site, or other method acceptable to authorities having jurisdiction.
- C. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

- D. Flammability: Comply with applicable code for surface burning characteristics.
- E. Colors:
 - 1. Extend colors to surface edges; colors may change at any edge as directed by Architect.
 - 2. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.
 - 3. Exterior paint:
 - a. Lintels: Sherwin-Williams - Wool Skein; SW 6148.
 - b. Railings: Sherwin-Williams - Black Magic; SW 6991.
 - 4. Interior paint:
 - a. Walls/Ceilings: Match existing color and sheen.
 - b. ACT Ceiling Grid: Sherwin-Williams - Ceiling Bright White; SW 7007.
 - 5. Interior Stain:
 - a. As selected by Architect from manufacturer's full range of colors.

2.03 PAINT SYSTEMS - EXTERIOR

- A. Exterior Ferrous Metal - Galvanized and Non-Galvanized; Lintels, railings, and other ferrous metal items shown on drawings to be painted.
 - 1. Two topcoats and one coat primer.
 - 2. Semi-Gloss Finish.
 - a. Primer: Sherwin-Williams DTM Acrylic Primer Product No. B-66-W1.
 - b. Topcoat Product: Sherwin-Williams DTM Acrylic Coating Product No. B-66-W2-11.

2.04 PAINT SYSTEMS - INTERIOR

- A. Interior Surfaces Indicated to be Painted, including gypsum board, concrete, concrete masonry, shop primed steel, and galvanized steel.
 - 1. Two top coats and one coat primer.
 - 2. Eggshell: MPI gloss level 3; use this sheen at all locations.
 - 3. Top Coat Product(s):
 - a. Sherwin-Williams ProMar 200 Zero VOC Interior Latex.
 - 4. Primer(s): As recommended by manufacturer of top coats.
- B. Interior Surfaces Indicated to receive Stain and Transparent Finish:
 - 1. Two coats varnish over one coat stain.
 - 2. Stain: Semi-transparent stain for wood
 - a. Sherwin-Williams Minwax - Performance Series Tintable Wood Stain 250 VOC.
 - 3. Varnish: Polyurethane.
 - a. Sherwin-Williams Minwax - Polycrylic Protective Finish
 - b. Semi-Gloss.
- C. Interior Ferrous Metal Galvanized and Non-Galvanized; Handrails, hollow metal frames and other ferrous metal items shown on drawings to be painted.
 - 1. Two top coats and one coat primer.
 - 2. Semi- Gloss.
 - 3. Top Coat Product(s):
 - a. Latex, interior, semi-gloss: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series, at 4.0 mils wet, 1.6 mils dry, per coat.
 - 4. Primer(s): SW Pro- Cryl Universal Primer, B66-310.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Test shop-applied primer for compatibility with subsequent cover materials.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or repair existing coatings that exhibit surface defects.
- D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- E. Seal surfaces that might cause bleed through or staining of topcoat.
- F. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.
- G. Wood Surfaces to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.
- H. Remove mildew from impervious surfaces by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- I. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.
- J. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
- K. Corroded Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-PC 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning).
- L. Uncorroded, Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand or power tool wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.
- M. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

3.03 APPLICATION

- A. Protect adjacent materials from damage as a result of this work.
- B. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- C. Apply products in accordance with manufacturer's written instructions.
- D. Apply coatings at spread rate required to achieve manufacturer's recommended dry film thickness.
- E. Coordinate this work with joint sealant installation as specified in Section 07 9200 and as noted on Drawings.

- F. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- G. Apply each coat to uniform appearance.
- H. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
- I. Sand metal surfaces lightly between coats to achieve required finish.
 - 1. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- J. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 PRIMING

- A. Apply primer to all surfaces unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.
- B. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

3.05 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.
- B. Clean surfaces immediately of overspray, splatter, and excess material.
- C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.

3.06 PROTECTION

- A. Protect finished coatings from damage until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SECTION 12 2400 WINDOW SHADES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Window shades and accessories.

1.02 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week prior to commencing work related to products of this section; require attendance of all affected installers.
- B. Sequencing:
 - 1. Do not fabricate shades until field dimensions for each opening have been taken.
 - 2. Do not install shades until final surface finishes and painting are complete.

1.03 SUBMITTALS

- A. See Division One, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.
- C. Shop Drawings: Include shade schedule indicating size, location and keys to details, head, jamb and sill details, mounting dimension requirements for each product and condition, and operation direction.
- D. Verification Samples: Minimum size 6 inches square, representing actual materials, color and pattern.
- E. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- F. Operation and Maintenance Data: List of all components with part numbers, sources of supply, and operation and maintenance instructions; include copy of shop drawings.
- G. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of experience.
- B. Installer Qualifications: Company specializing in performing work of this type with minimum five years of documented experience.
 - 1. Factory training and demonstrated experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver shades in manufacturer's unopened packaging, labeled to identify each shade for each opening.
- B. Handle and store shades in accordance with manufacturer's recommendations.

1.06 WARRANTY

- A. Provide manufacturer's warranty from the Date of Substantial Completion, covering the following:
 - 1. Shade Hardware: 2 years.
 - 2. Fabric: 2 years.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Manually Operated Roller Shades:

1. Basis of Design: Draper, Inc; Clutch Operated FlexShade including Single and Dual Roller: www.draperinc.com.
 2. Hunter Douglas: www.hunterdouglas.com.
 3. Graber, division of Springs Window Fashions: www.graberblinds.com.
 4. Substitutions: See Division One.
- B. Source Limitations: Furnish products produced by a single manufacturer and obtained from a single supplier.

2.02 WINDOW SHADE APPLICATIONS

- A. Shades: Blackout shades with second shade in same opening.
1. Type: Roller shades.
 2. Fabric: Sheer:Phifer SW2400. Blackout: SunBloc SB9000.
 3. Colors: Shown in Window Schedule on drawings.
 4. Mounting: On face of jambs, below ceiling.
 5. Operation: Manual.

2.03 ROLLER SHADES

- A. Roller Shades: Fabric roller shades complete with mounting brackets, roller tubes, hembars, hardware and accessories; fully factory-assembled.
1. Drop: Regular roll.
 2. Size: As indicated on drawings.
- B. Fabric: Non-flammable, color-fast, impervious to heat and moisture, and able to retain its shape under normal operation.
1. Blackout Shades: Block virtually all the light; Openness Factor equal to zero (0).
 2. Flammability: Pass NFPA 701 large and small tests.
- C. Roller Tube: As required for type of operation, extruded aluminum with end caps.
1. Dimensions: Manufacturer's standard, selected for suitability for installation conditions, span, and weight of shades.
 2. Fabric Attachment: Utilize double sided adhesive tape.
 3. Finish: Clear anodized.
- D. Hembars and Hembar Pockets: Wall thickness designed for weight requirements and adaptation to uneven surfaces, to maintain bottom of shade straight and flat.
1. Style: Full wrap fabric covered bottom bar, flat profile with closed ends.
- E. Manual Operation: Clutch operated continuous loop; beaded ball chain meeting WCMA A100.1.
1. Chain Retainer: Chain tensioning device complying with WCMA A100.1.

2.04 ACCESSORIES

- A. Fascias: Size as required to conceal shade mounting.
1. Style: As selected by Architect from shade manufacturer's full selection.
- B. Brackets and Mounting Hardware: As recommended by manufacturer for mounting configuration and span indicated.
- C. Fasteners: Non-corrosive, and as recommended by shade manufacturer.

2.05 FABRICATION

- A. Field measure finished openings prior to ordering or fabrication.
- B. Fabricate shades to fit openings within specified tolerances.
1. Vertical Dimensions: Fill openings from head to sill with 1/2 inch space between bottom bar and window stool.
 2. Horizontal Dimensions – Outside Mounting: Extend shades 2 inches beyond jambs on each side.
- C. Dimensional Tolerances: As recommended in writing by manufacturer.

- D. At openings requiring continuous multiple shade units with separate rollers, locate roller joints at window mullion centers; butt rollers end-to-end.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine finished openings for deficiencies that may preclude satisfactory installation.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Start of installation shall be considered acceptance of substrates.

3.02 PREPARATION

- A. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under the project conditions.
- B. Coordinate with window installation and placement of concealed blocking to support shades.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.
- B. Installation Tolerances:
 - 1. Maximum Offset From Level: 1/16 inch.
- C. Replace blinds that exceed specified dimensional tolerances at no extra cost to Owner.
- D. Adjust level, projection and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure shades for smooth operation.

3.04 CLEANING

- A. Clean soiled shades and exposed components as recommended by manufacturer.
- B. Replace shades that cannot be cleaned to "like new" condition.

3.05 CLOSEOUT ACTIVITIES

- A. Demonstration: Demonstrate operation and maintenance of window shade system to Owner's personnel.
- B. Training: Train Owner's personnel on operation and maintenance of system.
 - 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
 - 2. Provide minimum of two hours training by manufacturer's authorized personnel at location designated by the Owner.

3.06 PROTECTION

- A. Protect installed products from subsequent construction operations.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Single conductor building wire.
- B. Metal-clad cable.
- C. Wiring connectors.

1.02 RELATED REQUIREMENTS

- A. Section 26 05 26 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.
- B. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

- A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire 2013 (Reapproved 2018).
- B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft 2011 (Reapproved 2017).
- C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes 2010 (Reapproved 2014).
- D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation 2004 (Reapproved 2014).
- E. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- F. NECA 120 - Standard for Installing Armored Cable (AC) and Metal-Clad Cable (MC) 2012.
- G. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy 2009.
- H. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- I. UL 44 - Thermoset-Insulated Wires and Cables Current Edition, Including All Revisions.
- J. UL 83 - Thermoplastic-Insulated Wires and Cables Current Edition, Including All Revisions.
- K. UL 486A-486B - Wire Connectors Current Edition, Including All Revisions.
- L. UL 486C - Splicing Wire Connectors Current Edition, Including All Revisions.
- M. UL 1569 - Metal-Clad Cables Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:

1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
2. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.
3. Notify engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 CONDUCTOR AND CABLE APPLICATIONS

- A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.
- B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.
- C. Nonmetallic-sheathed cable is not permitted.
- D. Metal-clad cable is permitted only as follows:
 1. Where not otherwise restricted, may be used:
 - a. Where concealed above accessible ceilings for final connections from junction boxes to luminaires.
 - 1) Maximum Length: 6' feet.

2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

- A. Provide products that comply with requirements of NFPA 70.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.
- D. Comply with NEMA WC 70.
- E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.
- F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.
- G. Conductor Material:
 1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
 2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.

3. Tinned Copper Conductors: Comply with ASTM B33.

H. Conductor Color Coding:

1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
2. Color Coding Method: Integrally colored insulation.
3. Color Code:
 - a. 480Y/277 V, 3 Phase, 4 Wire System:
 - 1) Phase A: Brown.
 - 2) Phase B: Orange.
 - 3) Phase C: Yellow.
 - 4) Neutral/Grounded: Gray.
 - b. 208Y/120 V, 3 Phase, 4 Wire System:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - 4) Neutral/Grounded: White.
 - c. Equipment Ground, All Systems: Green.

2.03 SINGLE CONDUCTOR BUILDING WIRE

- A. Description: Single conductor insulated wire.
- B. Conductor Stranding:
 1. Feeders and Branch Circuits:
 - a. Size 10 AWG and Smaller: Solid.
 - b. Size 8 AWG and Larger: Stranded.
- C. Insulation Voltage Rating: 600 V.
- D. Insulation:
 1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.

2.04 METAL-CLAD CABLE

- A. Manufacturers:
 1. AFC Cable Systems Inc: www.afcweb.com/#sle.
 2. Encore Wire Corporation: www.encorewire.com/#sle.
 3. Southwire Company: www.southwire.com/#sle.
- B. Description: NFPA 70, Type MC cable listed and labeled as complying with UL 1569, and listed for use in classified firestop systems to be used.
- C. Conductor Stranding:
 1. Size 10 AWG and Smaller: Solid.
 2. Size 8 AWG and Larger: Stranded.
- D. Insulation Voltage Rating: 600 V.
- E. Insulation: Type THHN, THHN/THWN, or THHN/THWN-2.
- F. Grounding: Full-size integral equipment grounding conductor.
- G. Armor: Steel, interlocked tape.

2.05 WIRING CONNECTORS

- A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.
- B. Connectors for Grounding and Bonding: Comply with Section 26 05 26.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that interior of building has been protected from weather.
- B. Verify that work likely to damage wire and cable has been completed.
- C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.
- D. Verify that field measurements are as indicated.
- E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Circuiting Requirements:
 - 1. Unless dimensioned, circuit routing indicated is diagrammatic.
 - 2. When circuit destination is indicated without specific routing, determine exact routing required.
 - 3. Arrange circuiting to minimize splices.
 - 4. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among single phase branch circuits of different phases installed in the same raceway is not permitted. Provide dedicated neutral/grounded conductor for each individual branch circuit.
- B. Install products in accordance with manufacturer's instructions.
- C. Perform work in accordance with NECA 1 (general workmanship).
- D. Install metal-clad cable (Type MC) in accordance with NECA 120.
- E. Installation in Raceway:
 - 1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
 - 2. Pull all conductors and cables together into raceway at same time.
 - 3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
 - 4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.
- F. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.
- G. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.
- H. Terminate cables using suitable fittings.
 - 1. Metal-Clad Cable (Type MC):
 - a. Use listed fittings.

- b. Cut cable armor only using specialized tools to prevent damaging conductors or insulation. Do not use hacksaw or wire cutters to cut armor.
- I. Install conductors with a minimum of 12 inches of slack at each outlet.
- J. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.
- K. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.
- L. Make wiring connections using specified wiring connectors.
 - 1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
 - 2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
 - 3. Do not remove conductor strands to facilitate insertion into connector.
 - 4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.
- M. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.
- N. Insulate ends of spare conductors using vinyl insulating electrical tape.
- O. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.
- P. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

END OF SECTION

SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Grounding and bonding requirements.
- B. Conductors for grounding and bonding.
- C. Connectors for grounding and bonding.

1.02 RELATED REQUIREMENTS

- A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.
- B. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- B. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. UL 467 - Grounding and Bonding Equipment Current Edition, Including All Revisions.

1.04 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.

PART 2 PRODUCTS

2.01 GROUNDING AND BONDING REQUIREMENTS

- A. Do not use products for applications other than as permitted by NFPA 70 and product listing.
- B. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.
- C. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.02 GROUNDING AND BONDING COMPONENTS

- A. General Requirements:
 - 1. Provide products listed, classified, and labeled as suitable for the purpose intended.
 - 2. Provide products listed and labeled as complying with UL 467 where applicable.
- B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 26 05 26:

1. Use insulated copper conductors unless otherwise indicated.
- C. Connectors for Grounding and Bonding:
 1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
 2. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Make grounding and bonding connections using specified connectors.
 1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
 2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
 3. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
 4. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
- D. Identify grounding and bonding system components in accordance with Section 26 05 53.

END OF SECTION

SECTION 26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Support and attachment requirements and components for equipment, conduit, cable, boxes, and other electrical work.

1.02 RELATED REQUIREMENTS

- A. Section 26 05 33.13 - Conduit for Electrical Systems: Additional support and attachment requirements for conduits.
- B. Section 26 05 33.16 - Boxes for Electrical Systems: Additional support and attachment requirements for boxes.

1.03 REFERENCE STANDARDS

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.
- C. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel 2015.
- D. MFMA-4 - Metal Framing Standards Publication 2004.
- E. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- F. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.
 - 2. Coordinate the work with other trades to provide additional framing and materials required for installation.
 - 3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
 - 4. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.

1.05 QUALITY ASSURANCE

- A. Comply with NFPA 70.
- B. Comply with applicable building code.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 SUPPORT AND ATTACHMENT COMPONENTS

- A. General Requirements:
 - 1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of electrical work.
 - 2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
 - 3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported. Include consideration for vibration, equipment operation, and shock loads where applicable.
 - 4. Do not use products for applications other than as permitted by NFPA 70 and product listing.
 - 5. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.
 - 6. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
 - a. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
 - b. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.
- B. Conduit and Cable Supports: Straps, clamps, etc. suitable for the conduit or cable to be supported.
 - 1. Conduit Straps: One-hole or two-hole type; steel or malleable iron.
 - 2. Conduit Clamps: Bolted type unless otherwise indicated.
- C. Outlet Box Supports: Hangers, brackets, etc. suitable for the boxes to be supported.
- D. Metal Channel (Strut) Framing Systems: Factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
 - 1. Comply with MFMA-4.
 - 2. Channel Material:
 - a. Indoor Dry Locations: Use painted steel or zinc-plated steel.
 - b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel.
 - 3. Minimum Channel Thickness: Steel sheet, 12 gage, 0.1046 inch.
 - 4. Minimum Channel Dimensions: 1-5/8 inch width by 13/16 inch height.
- E. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.
 - 1. Minimum Size, Unless Otherwise Indicated or Required:
 - a. Equipment Supports: 1/2 inch diameter.
 - b. Trapeze Support for Multiple Conduits: 3/8 inch diameter.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive support and attachment components.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
- D. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.
- E. Unless specifically indicated or approved by Architect, do not provide support from roof deck.
- F. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
- G. Equipment Support and Attachment:
 - 1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
 - 2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
 - 3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
 - 4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
- H. Secure fasteners according to manufacturer's recommended torque settings.
- I. Remove temporary supports.

3.03 FIELD QUALITY CONTROL

- A. Inspect support and attachment components for damage and defects.
- B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
- C. Correct deficiencies and replace damaged or defective support and attachment components.

END OF SECTION

SECTION 26 05 33.13 - CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Galvanized steel rigid metal conduit (RMC).
- B. Electrical metallic tubing (EMT).
- C. Conduit fittings.

1.02 RELATED REQUIREMENTS

- A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Metal clad cable (Type MC), armored cable (Type AC), and manufactured wiring systems, including uses permitted.
- B. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
- C. Section 26 05 29 - Hangers and Supports for Electrical Systems.
- D. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

- A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC) 2015.
- B. ANSI C80.3 - American National Standard for Electrical Metallic Tubing -- Steel (EMT-S) 2015.
- C. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- D. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT) 2013.
- E. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable 2014.
- F. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. UL 1 - Flexible Metal Conduit Current Edition, Including All Revisions.
- H. UL 6 - Electrical Rigid Metal Conduit-Steel Current Edition, Including All Revisions.
- I. UL 514B - Conduit, Tubing, and Cable Fittings Current Edition, Including All Revisions.
- J. UL 797 - Electrical Metallic Tubing-Steel Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate minimum sizes of conduits with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
 - 2. Coordinate the arrangement of conduits with structural members, ductwork, piping, equipment and other potential conflicts installed under other sections or by others.

3. Verify exact conduit termination locations required for boxes, enclosures, and equipment installed under other sections or by others.
 4. Notify engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Sequencing:
1. Do not begin installation of conductors and cables until installation of conduit is complete between outlet, junction and splicing points.

1.05 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.

PART 2 PRODUCTS

2.01 CONDUIT APPLICATIONS

- A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.
- B. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, comply with the most restrictive requirements. Where conduit type for a particular application is not specified, use galvanized steel rigid metal conduit.
- C. Exposed, Interior, Not Subject to Physical Damage: Use galvanized steel rigid metal conduit or electrical metallic tubing (EMT).
- D. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit.
- E. Connections to Luminaires Above Accessible Ceilings: Use flexible metal conduit.
1. Maximum Length: 6' .
- F. Connections to Vibrating Equipment:
1. Dry Locations: Use flexible metal conduit.
- G. Fished in Existing Walls, Where Necessary: Use flexible metal conduit.

2.02 CONDUIT REQUIREMENTS

- A. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

- A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.
- B. Fittings:
1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.

2. Material: Use steel.
3. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.04 FLEXIBLE METAL CONDUIT (FMC)

- A. Description: NFPA 70, Type FMC standard wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems to be used.
- B. Fittings:
 1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
 2. Material: Use steel or malleable iron.

2.05 ELECTRICAL METALLIC TUBING (EMT)

- A. Description: NFPA 70, Type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.
- B. Fittings:
 1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
 2. Material: Use steel.
 3. Connectors and Couplings: Use compression (gland) or set-screw type.
 - a. Do not use indenter type connectors and couplings.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive conduits.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.
- D. Conduit Routing:
 1. Unless dimensioned, conduit routing indicated is diagrammatic.
 2. When conduit destination is indicated without specific routing, determine exact routing required.
 3. Conceal all conduits unless specifically indicated to be exposed.
 4. Conduits in the following areas may be exposed, unless otherwise indicated:
 - a. Within joists in areas with no ceiling.
 5. Unless otherwise approved, do not route conduits exposed:
 - a. Across floors.
 - b. Across roofs.
 - c. Across building exterior surfaces.

6. Arrange conduit to maintain adequate headroom, clearances, and access.
 7. Route conduits above water and drain piping where possible.
 8. Arrange conduit to prevent moisture traps. Provide drain fittings at low points and at sealing fittings where moisture may collect.
- E. Conduit Support:
1. Secure and support conduits in accordance with NFPA 70 and Section 26 05 29 using suitable supports and methods approved by the authority having jurisdiction.
 2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
 3. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.
- F. Connections and Terminations:
1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
 2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
 3. Use suitable adapters where required to transition from one type of conduit to another.
 4. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
 5. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
 6. Secure joints and connections to provide maximum mechanical strength and electrical continuity.
- G. Penetrations:
1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
 2. Make penetrations perpendicular to surfaces unless otherwise indicated.
 3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
 4. Conceal bends for conduit risers emerging above ground.
 5. Seal interior of conduits entering the building from underground at first accessible point to prevent entry of moisture and gases.
 6. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
 7. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty.
 8. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.
- H. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
 2. Where conduits are subject to earth movement by settlement or frost.
- I. Condensation Prevention: Where conduits cross barriers between areas of potential substantial temperature differential, provide sealing fitting or approved sealing compound at an accessible point near the penetration to prevent condensation. This includes, but is not limited to:
1. Where conduits pass from outdoors into conditioned interior spaces.
 2. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.
- J. Provide grounding and bonding in accordance with Section 26 05 26.

3.03 FIELD QUALITY CONTROL

- A. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
- B. Correct deficiencies and replace damaged or defective conduits.

3.04 CLEANING

- A. Clean interior of conduits to remove moisture and foreign matter.

END OF SECTION

SECTION 26 05 33.16 - BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Outlet and device boxes up to 100 cubic inches, including those used as junction and pull boxes.
- B. Boxes and enclosures for integrated power, data, and audio/video.

1.02 RELATED REQUIREMENTS

- A. Section 26 05 29 - Hangers and Supports for Electrical Systems.
- B. Section 26 05 33.13 - Conduit for Electrical Systems:
 - 1. Conduit bodies and other fittings.
- C. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- B. NECA 130 - Standard for Installing and Maintaining Wiring Devices 2010.
- C. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable 2014.
- D. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports 2013.
- E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum) 2020.
- F. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations Current Edition, Including All Revisions.
- H. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations Current Edition, Including All Revisions.
- I. UL 508A - Industrial Control Panels 2013.
- J. UL 514A - Metallic Outlet Boxes Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
 - 2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.

3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.
4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.
5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others.
6. Coordinate the work with other trades to preserve insulation integrity.
7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.
8. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 BOXES

- A. General Requirements:
 1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
 2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
 3. Provide products listed, classified, and labeled as suitable for the purpose intended.
 4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
 5. Provide grounding terminals within boxes where equipment grounding conductors terminate.
- B. Outlet and Device Boxes Up to 100 cubic inches, Including Those Used as Junction and Pull Boxes:
 1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
 2. Use cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
 3. Use cast aluminum boxes where exposed galvanized steel rigid metal conduit is used.
 4. Use suitable masonry type boxes where flush-mounted in masonry walls.
 5. Use raised covers suitable for the type of wall construction and device configuration where required.
 6. Use shallow boxes where required by the type of wall construction.
 7. Do not use "through-wall" boxes designed for access from both sides of wall.
 8. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
 9. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
 10. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.
 11. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes unless specifically indicated or permitted.
 12. Wall Plates: Comply with Section 26 27 26.

- C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches:
 - 1. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
 - 2. NEMA 250 Environment Type, Unless Otherwise Indicated:
 - a. Indoor Clean, Dry Locations: Type 1, painted steel.
 - b. Outdoor Locations: Type 3R, painted steel.
 - 3. Junction and Pull Boxes Larger Than 100 cubic inches:
 - a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive boxes.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Unless otherwise indicated, provide separate boxes for line voltage and low voltage systems.
- E. Flush-mount boxes in finished areas unless specifically indicated to be surface-mounted.
- F. Unless otherwise indicated, boxes may be surface-mounted where exposed conduits are indicated or permitted.
- G. Box Locations:
 - 1. Locate boxes to be accessible. Provide access panels in accordance with Section 08 31 00 as required where approved by the Architect.
 - 2. Unless dimensioned, box locations indicated are approximate.
 - 3. Locate boxes as required for devices installed under other sections or by others.
 - a. Switches, Receptacles, and Other Wiring Devices: Comply with Section 26 27 26.
 - b. Communications Systems Outlets: Comply with Section 27 10 00.
 - 4. Locate junction and pull boxes in the following areas, unless otherwise indicated or approved by the Architect:
 - a. Concealed above accessible suspended ceilings.
 - b. Within joists in areas with no ceiling.
 - c. Electrical rooms.
 - d. Mechanical equipment rooms.
- H. Box Supports:
 - 1. Secure and support boxes in accordance with NFPA 70 and Section 26 05 29 using suitable supports and methods approved by the authority having jurisdiction.
 - 2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.

- 3. Installation Above Suspended Ceilings: Do not provide support from ceiling grid or ceiling support system.
 - I. Install boxes plumb and level.
 - J. Flush-Mounted Boxes:
 - 1. Install boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4 inch or does not project beyond finished surface.
 - 2. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface.
 - 3. Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8 inch at the edge of the box.
 - K. Install boxes as required to preserve insulation integrity.
 - L. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
 - M. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.
 - N. Close unused box openings.
 - O. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.
 - P. Provide grounding and bonding in accordance with Section 26 05 26.
 - Q. Identify boxes in accordance with Section 26 05 53.
- 3.03 CLEANING
- A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.

END OF SECTION

SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Electrical identification requirements.

1.02 RELATED REQUIREMENTS

- A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Color coding for power conductors and cables 600 V and less; vinyl color coding electrical tape.

PART 2 PRODUCTS

2.01 IDENTIFICATION REQUIREMENTS

- A. Identification for Conductors and Cables:
 - 1. Color Coding for Power Conductors 600 V and Less: Comply with Section 26 05 19.
- B. Identification for Devices:
 - 1. Use identification label to identify serving branch circuit for all lighting.

2.02 IDENTIFICATION NAMEPLATES AND LABELS

- A. Identification Labels:
 - 1. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
 - 2. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.
- B. Format for Luminaire Identification:
 - 1. Minimum Size: 3/8 inch by 1.5 inches.
 - 2. Legend: Power source and circuit number or other designation indicated.
 - 3. Text: All capitalized unless otherwise indicated.
 - 4. Minimum Text Height: 3/16 inch.
 - 5. Color: Black text on clear background.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:
 - 1. Conductors and Cables: Legible from the point of access.
- C. Install identification products centered, level, and parallel with lines of item being identified.

- D. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.

3.02 FIELD QUALITY CONTROL

- A. Replace self-adhesive labels and markers that exhibit bubbles, wrinkles, curling or other signs of improper adhesion.

END OF SECTION

SECTION 26 56 00 - EXTERIOR LIGHTING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Exterior luminaires.

1.02 RELATED REQUIREMENTS

- A. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
- B. Section 26 05 29 - Hangers and Supports for Electrical Systems.
- C. Section 26 05 33.16 - Boxes for Electrical Systems.

1.03 REFERENCE STANDARDS

- A. IES LM-80 - Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays, and Modules 2015, with Errata (2017).
- B. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- C. NECA/IESNA 501 - Standard for Installing Exterior Lighting Systems 2006.
- D. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- E. UL 1598 - Luminaires Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. Shop Drawings:
 - 1. Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
 - 2. Provide photometric calculations where luminaires are proposed for substitution upon request.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, weight, effective projected area (EPA), and installed accessories; include model number nomenclature clearly marked with all proposed features.
 - 1. LED Luminaires:
 - a. Include estimated useful life, calculated based on IES LM-80 test data.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Receive, handle, and store products according to NECA/IESNA 501 and manufacturer's written instructions.
- B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.

1.06 WARRANTY

- A. Provide five year manufacturer warranty for all LED luminaires, including drivers.

PART 2 PRODUCTS

2.01 LUMINAIRE TYPES

- A. Furnish products as indicated in luminaire schedule included on the drawings.

2.02 LUMINAIRES

- A. Manufacturers but not limited to:
 - 1. Acuity Brands, Inc: www.acuitybrands.com/#sle.
 - 2. Sternberg Lighting
 - 3. Cooper Lighting, a division of Cooper Industries: www.cooperindustries.com/#sle.
 - 4. Philips Lighting North America Corporation; www.lightingproducts.philips.com/#sle.
- B. Provide products that comply with requirements of NFPA 70.
- C. Provide products that are listed and labeled as complying with UL 1598, where applicable.
- D. Provide products listed, classified, and labeled as suitable for the purpose intended.
- E. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.
- F. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, poles, foundations, supports, trims, accessories, etc. as necessary for a complete operating system.
- G. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.
- C. Verify that suitable support frames are installed where required.
- D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.
- E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION

- A. Coordinate locations of outlet boxes provided under Section 26 05 33.16 as required for installation of luminaires provided under this section.
- B. Install products in accordance with manufacturer's instructions.
- C. Install luminaires in accordance with NECA/IESNA 501.
- D. Provide required support and attachment in accordance with Section 26 05 29.
- E. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.
- F. Install accessories furnished with each luminaire.
- G. Bond products and metal accessories to branch circuit equipment grounding conductor.
- H. Install lamps in each luminaire.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for additional requirements.
- B. Inspect each product for damage and defects.
- C. Operate each luminaire after installation and connection to verify proper operation.
- D. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Architect.

3.05 ADJUSTING

- A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by engineer. Secure locking fittings in place.
- B. Luminaires with Field-Rotatable Optics: Position optics according to manufacturer's instructions to achieve lighting distribution as indicated or as directed by engineer.

3.06 CLEANING

- A. Clean surfaces according to NECA/IESNA 501 and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

3.07 PROTECTION

- A. Protect installed luminaires from subsequent construction operations.

END OF SECTION

SECTION 32 1313 - CONCRETE PAVEMENT

PART 1 GENERAL

1.1 SUMMARY

1. Cast-in-place concrete paving shall be installed by the Contractor if for all portions of the project that have been accepted by the owner to be installed as concrete pavement in lieu of asphalt paving. This section applies to exterior driving and walking surfaces depicted on the plan.

1.2 SUBMITTALS

1. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
2. Design Mixes: Submit for approval design mixes, including adjustments for variations in project conditions.
 - a. Mixes to be designed in accordance with the Portland Cement Association.
 - b. All exposed concrete shall be air entrained. Allowable ranges shall be as follows:
 1. $\frac{3}{4}$ " to 1" aggregate size shall contain 6.0% average entrained air. The total air content range shall be between 5%-7%.
 - c. All concrete shall achieve 4000 psi compressive strength in 28 days.
 - d. Flint and chert to be limited to 1% maximum, by weight of the coarse aggregate, in all exposed concrete. Lignite will be limited to 0.07% by weight of the fine aggregate in all exposed concrete.
 - e. Sand shall be from local sources meeting ASTM C-33 Size 67 for concrete.
 - f. The use of calcium chloride in concrete mixes will not be permitted. Fly ash is permitted as needed to reduce the total amount of portland cement, which would otherwise be used, by not more than 30 percent. Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 - a. Fly Ash: 15 percent.
 - g. Maximum water-to-cementitious materials ratio shall be .48
 - h. Concrete slump shall be a maximum of 4" +/- 1" (ASTM C- 143) as delivered in the field. Contractor may use chemical admixtures to attain a maximum slump of 8" for workability. No water may be added to the concrete mix on site unless water is withheld at the batching facility. If water is withheld at the batching facility it should be reflected on the load ticket. The total amount of water in the mix shall not exceed what is noted on the approved mixed. This shall be noted in the special inspector's records.

3. Test Mix Reports: Submit test reports for approval prior to construction.

1.3 QUALITY ASSURANCE

1. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
2. Construction Tolerance: 1/8' in 10' for grade and alignment of top of forms; 1/4' in 10' for vertical face on longitudinal axis.
3. Testing: Independent testing agency shall be obtained by the contractor. Testing requirements shall be as follows:
 - a. An ACI certified Grade I field technician shall perform the testing
 - b. Test shall be performed for strength, air entrainment, temperature, and slump. Strength tests will require 4 cylinders (1 broken @ 7 days; 2 broken @ 28 days, 1 spare). Test results should be sent to the contractor, architect, and owner's representative.
 - c. Concrete will be tested at the minimum rate of one test for the first 25 cubic yards placed each day, and one test for each additional 50 cubic yards placed thereafter.
 - d. Test data from concrete cylinder breaks will be evaluated using procedures of ACI 214.

PART 2 PRODUCTS

2.1 MATERIALS

1. Concrete Paving Materials:
 1. Accessories:
 - a. Wire Mesh Reinforcement: Welded plain steel wire fabric, ASTM A 185.
 - b. Reinforcing Bars: Deformed steel bars, ASTM A 615, Grade 60.
 - c. Fabricated Bar Mats: Steel bar or rod mats, ASTM A 184, using ASTM A 615, Grade 60 steel bars.
 - d. Joint Dowel Bars: Plain steel bars, ASTM A 615, Grade 60.
 - e. Hook Bolts: ASTM A 307, Grade A threaded bolts.
 - f. Liquid-Membrane Forming and Sealing Curing Compound: ASTM C 309, Type I, Class A.
 - g. Bonding Compound: Polyvinyl acetate or acrylic base.
 - h. Color Pigment: ASTM C 979.
 - i. Marking Paint: FS TT-P-1952 white for parking stripes, and blue at handicap areas.
 - j. Epoxy Adhesive: ASTM C 881.

PART 3 EXECUTION

3.1 INSTALLATION

1. Comply with ACI 301 for measuring, mixing, transporting, and placing concrete.
2. Proof roll subbase and check for unstable areas. Report unsatisfactory conditions in writing to the owners representative.
3. Comply with concrete section for concrete mix, testing placement, joints, tolerances,

curing, repairs and protection.

4. Dispose of over-mixed concrete off-site in a legal manner.
5. Protect concrete paving until weight of a person will not leave any impression. Remove and replace concrete paving, which shows impressions or other defects. Skim coating defects is not acceptable.
6. Contraction joints shall be tooled during finishing or sawed within 18 hours of concrete placement. If the joint edge ravel, do not proceed until concrete has sufficient cure time to saw without damage.
 - a. Contraction joints shall have a minimum depth of $\frac{1}{4}$ of the pavement thickness and a minimum width of $\frac{1}{8}$ "
 - b. Transverse contraction joints will be provided at a maximum of 2.5 times the pavement thickness (in inches) in feet for street pavements and 2.0 times for all other pavements.
 - c. Longitudinal joints shall have a maximum separation of 12 feet for streets and drives and 9 feet for sidewalks.
 - d. The ratio of slab width to length should not exceed 1.67 for street pavements and 1.25 for all other pavements.
 - e. All joints to be sealed with bituminous joint sealant.
7. Sweep and clean surface to eliminate loose material and dust and apply paint with mechanical equipment to produce pavement markings of dimensions indicated with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils

END OF SECTION 32 1313