

**PROJECT MANUAL FOR:**

# **Mizzou North Demolition**

**PROJECT NO.: CP219078**

**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:  
September 13, 2022**

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



09.13.2022

Signature: \_\_\_\_\_

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

**Certified Drawings:**

- G001 COVER SHEET
- G002 LOCATION MAP, LIST OF DRAWINGS, CODES
- G003 SALVAGE ITEMS MATRIX
- G004 SALVAGE – REFERENCE FLOOR PLANS
- D101 DEMOLITION PLAN & EXISTING PHOTOS

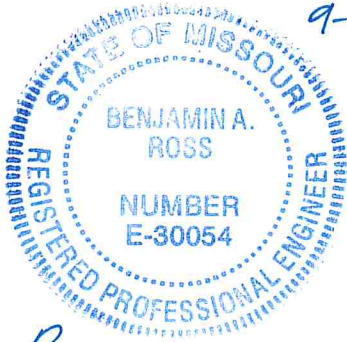
**Certified Specification Sections:**

02 4100 Demolition

**CIVIL 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.

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



Signature: Benjamin A. Ross

Benjamin A. Ross, P.E.  
Registered Professional Engineer  
MO License No.: E-30054

**Certified Drawings:**

**Certified Specification Sections:**

C0.01	Cover & General Notes	22 1313	Facility Sanitary Sewers
C1.02 – C1.02	Temporary Traffic Control Plan	31 1000	Site Clearing
C2.01	Overall Erosion Control Plan	31 2000	Earth Moving
C3.01	Overall Scope & Key Plan	31 2333	Trenching and Backfilling
C4.01	Phase 1 Demolition Plan	32 1216	Asphalt Paving
C4.02 – C4.06	Phase 2 Demolition Plan	32 1313	Concrete Paving
C5.01 – C5.05	Final Site Plan After Demolition	32 1373	Concrete Paving Joint Sealants
C6.01	Phase 1 Grading Plan	33 1415	Site Water Distribution Piping
C6.02	Phase 2 Grading Plan	33 4200	Stormwater Conveyance
C7.01	Site & Erosion Control Details		
C8.01	Temporary Traffic Control Details		
		SWPPP	

**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.

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 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



Signature: \_\_\_\_\_

Gary Fisher – MO License No.: PE-2018021177

**Certified Drawings:**

E000	Electrical Symbols, and Abbreviations
E101	Electrical Demolition Plan – North
E102	Electrical Demolition Plan – South
E201	Electrical New Work Plan – North
E202	Electrical New Work Plan – South
E300	Electrical Details

**Certified Specification Sections:**

26 0500	Common Work Results for Electrical
26 0519	Conductors and Cables
26 0526	Grounding and Bonding
26 0529	Hangers and Supports
26 0533	Raceways
26 0534	Boxes Cabinets and Enclosures
26 0543	Underground Ducts, Raceways, and Utility Structures.
26 0553	Identification for Electrical Systems
26 0600	Electrical Demolition
26 0923	Lighting Control Devices
26 2416	Panelboards

**SECTION 00 0110**

**TABLE OF CONTENTS**

Mizzou North Demolition  
Project CP219078  
Columbia, Missouri

**DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS**

00 0005-01.....Certification – Architect..... 1-1  
00 0005-02.....Certification – Civil..... 1-1  
00 0005-03.....Certification – Mechanical Electrical Plumbing Engineer..... 1-1  
00 0110.....Table of Contents..... 1-2

**DIVISION 01 – GENERAL REQUIREMENTS**

Advertisement for Bids

1.A.....Bid for Lump Sum Contract..... 1.A 1-5  
1.B.....Bidder’s Statement of Qualifications..... BSQ/1-2  
1.B.1.....Bidder’s Statement of Qualifications for Asbestos Abatement.....BSQAA/1-2  
1.B.2.....Supplier Diversity Compliance Evaluation..... SD 1-2  
1.B.3.....Application for Waiver..... SD 3-4  
1.B.4.....Affidavit for Affirmative Action..... SD 5-6  
1.B.5.....Certifying Supplier Diversity Agencies..... SD 7  
1.B.6.....Newspapers for Outreach to Diverse Suppliers..... SD 8  
1.B.7.....Affidavit of Supplier Diversity Participation..... SD 9  
1.C.....Information for Bidders..... IFB/1-5  
1.D.....General Conditions..... GC/1-43  
1.E.....Special Conditions..... SC 1-15  
1.E.1.....Scheduling Specification..... SS 1-5  
1.E.3.....Shop Drawing and Submittal Log..... SDSL 1-2  
1.E.5.....Closeout Log..... CLOSL 1-1  
1.F.....Index of Drawings..... INDEX 1-1  
1.G.....Prevailing Wage Rates..... PW 1-4  
1.I.....SWPPP..... 1-117  
01 7419.....Construction Waste Management..... 1-5  
.....Construction Waste Management Worksheet..... 1-2

**DIVISION 02 – EXISTING CONDITIONS**

02 0810..... Technical Specifications – Universal Wastes/Other Environmental Concerns  
Removal and Disposal..... 1-13

02 4100..... Demolition..... 1-3

02 8233..... Technical Specifications – Friable and Non-Friable Asbestos Removal..... 1-15  
..... Hazardous Materials Survey and Limited RCRA Metals Survey Report  
(Mizzou North Building)..... 1-78

..... Asbestos Survey and Universal Waste Visual Assessment Report  
(Mizzou North Block Storage Building)..... 1-21

..... In-Place Closure Report (Diesel Storage Tanks)..... 1-127

..... Underground Storage Tank – Individual Tank Report: DNR Tank IDs 1-5..... 1-5

**DIVISION 03 – 14 NOT USED**

**DIVISION 21 – NOT USED**

**DIVISION 22 – PLUMBING**

22 1313..... Facility Sanitary Sewers..... 1-4

**DIVISION 23 – NOT USED**

**DIVISION 25 – NOT USED**

**DIVISION 26 – ELECTRICAL**

26 0500..... Common Work Results for Electrical..... 1-6

26 0519..... Conductors and Cables..... 1-5

26 0526..... Grounding and Bonding..... 1-4

26 0529..... Hangers and Supports..... 1-3

26 0533..... Raceways..... 1-6

26 0534..... Boxes, Cabinets, and Enclosures..... 1-2

26 0543..... Underground Ducts, Raceways, and Utility Structures..... 1-3

26 0553..... Identification for Electrical Systems..... 1-5

26 0600..... Electrical Demolition..... 1-3

26 0923..... Lighting Control Devices..... 1-2

26 2416..... Panelboards..... 1-5

**DIVISION 27 - 28 NOT USED**

**DIVISION 31 – EARTHWORK**

31 1100..... Site Clearing..... 1-4

31 2000..... Earth Moving..... 1-10

31 2333..... Trenching and Backfilling..... 1-7

**DIVISION 32 – EXTERIOR IMPROVEMENTS**

32 1216..... Asphalt Paving..... 1-6

32 1313..... Concrete Paving..... 1-11

32 1373..... Concrete Paving Joint Sealants..... 1-4

**DIVISION 33 – UTILITIES**

33 1415..... Site Water Distribution Piping..... 1-6

33 4200..... Stormwater Conveyance..... 1-4

**END OF TABLE OF CONTENTS**

ADVERTISEMENT FOR BIDS

Sealed bids for:

MIZZOU NORTH –  
DEMOLITION  
UNIVERSITY OF MISSOURI  
COLUMBIA, MISSOURI

PROJECT NUMBER: CP219078

CONSTRUCTION ESTIMATE: \$6,694,090 - \$7,437,878

will be received by the Curators of the University of Missouri, Owner, at Campus Facilities, Planning, Design & Construction, Room L100 (Front Reception Desk), General Services Building, University of Missouri, Columbia, Missouri 65211, until 1:30 p.m., C.T., October 11, 2022 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, Inc. at (573)449-2683 or [eroselle@pwarchitects.com](mailto:eroselle@pwarchitects.com). Questions regarding commercial conditions should be directed to Pam Eugster at (573) 882-1444 or [eugsterpj@missouri.edu](mailto:eugsterpj@missouri.edu).

A prebid meeting will be held at 9:00 a.m., C.T., September 20, 2022 in the General Services Bldg., Room 194B.

Prebid site visit tours are available at four (4) specific dates and times. Please arrive at the specified start time. Meet at the south main entrance to the building. Everyone will need to sign in and out of the building.

The University has engaged a General Contractor to provide limited investigative demolition during the open site visits, as may be requested by bidders. Please contact Pat Hilden at [Hildenp@missouri.edu](mailto:Hildenp@missouri.edu) or (573) 554-4000 to schedule each time slot, and potential investigative demolition that is of interest.

Prebid site visits are offered at the following times:

Site Visit #1: September 20 from 11:00 a.m. – 2:00 p.m.  
Site Visit #2: September 21 from 9:00 a.m. – noon  
Site Visit #3: September 27 from 1:00 p.m. – 4:00 p.m.  
Site Visit #4: September 28 from 9:00 a.m. - noon

Information regarding bid results will be available the day following the bid opening by calling (573) 882-1133

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) 882-1133.

Advertisement Date: September 13, 2022

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 PWAarchitects, Inc., entitled "Mizzou North Demolition", project number CP219078, dated September 13, 2022, 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 to 1) demolish the existing building(s) and related infrastructure, 2) to remove and modify any other indicated site elements, and 3) to restore the site and utility systems to the noted finish condition(s); all as indicated on the Drawings and described in these Specifications for sum of:

\_\_\_\_\_  
\_\_\_\_\_  
DOLLARS (\$ \_\_\_\_\_).



b. Allowance:

Bidder shall include in the base bid sum an allowance of **Seventy-Five Thousand and 00/100 (\$75,000.00)** for additional abatement not included in the base bid scope identified in the bid documents. This allowance amount shall not include contractor's overhead and profit. The Contractor shall include overhead and profit on the allowance amount in his bid.

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 Four-Hundred and Eighty (480) 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.

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.

Demolition subcontractors have been pre-qualified for this project. To submit a responsive bid, one or more of the following demolition contractors must be listed as a sub-contractor.

- Ahrens Demolition (314) 631-7799
- Marschel Wrecking (636) 326-4940
- Spirtas Wrecking Co. (314) 290-2534
- Veit Specialty (763) 428-6741
- Brandenburg (312) 528-1135
- Alloy Group (636) 383-8328

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Work to be performed	Subcontractor Name,	City, State
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**Abatement**

**Demolition**

\_\_\_\_\_

**Mechanical**

\_\_\_\_\_

**Electrical**

\_\_\_\_\_

**6. SUPPLIER DIVERSITY PARTICIPATION GOALS**

a. The Contractor shall have as a goal subcontracting with Minority Business Enterprise (MBE) of Ten Percent (10%), with Service-Disabled Veteran Owned Business (SDVE) of Three Percent (3%), and with Women Business Enterprise (WBE), Disadvantage Business Enterprise (DBE), and/or Veteran Owned Business of Ten Percent (10%); 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 PERCENTAGE PARTICIPATION:**

\_\_\_\_\_percent (\_\_\_\_%)

**SDVE PERCENTAGE PARTICIPATION:**

\_\_\_\_\_percent (\_\_\_\_%)

**WBE, DBE, and/or VETERAN 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
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\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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.)

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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.)

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11. Workers Compensation Experience Modification Rates (last 3 yrs): \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Incidence Rates (last 3 years): \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

12. List banking references.

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- 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.

\_\_\_\_\_

6. 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
-------------------	------------------------------	--------------	-----------	-------------------------	-------------------


7. Other experience qualifying you for the work now bid.

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

8. 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 \_\_\_\_\_

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

9. (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 \_\_\_\_\_

10. 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.)

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11. 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.)

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12. Workers Compensation Experience Modification Rates (last 3 yrs): \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Incidence Rates (last 3 years): \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

13. List banking references.

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- 14. (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



**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 Serviced 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.

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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:

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Name:

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Title:

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Date:

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**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.

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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.

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

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

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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.

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

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

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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.

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

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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/slcdc/](http://www.stlouis-mo.gov/slcdc/)

Bi-State Development  
211 N. Broadway, Ste. 700  
St. Louis, MO 63102  
P: 314.982.1400  
W: [www.metrostlouis.dbesystem.com](http://www.metrostlouis.dbesystem.com)

St. Louis Minority Business Council  
211 N. Broadway, Ste. 1300  
St. Louis, MO 63102  
P: 314.231.5555  
W: [www.slmbc.org](http://www.slmbc.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](http://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](http://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. 12<sup>th</sup> Street  
Kansas City, MO 64106  
P: 816.513.1836  
W: [kcmohrd.mwdbe.com/?TN=kcmohrd](http://kcmohrd.mwdbe.com/?TN=kcmohrd)

Mid-States Minority Supplier Development Council  
505 N. 7<sup>th</sup> Street, Ste. 1820  
St. Louis, MO 63101  
P: 314.278.5616  
W: [midstatesdc.org](http://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](http://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](http://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](http://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](http://oa.mo.gov/sites/default/files/sdvelisting.pdf)  
[oeo.mo.gov/](http://oeo.mo.gov/)

## Minority Newspapers

Dos Mundos Bilingual Newspaper  
902A Southwest Blvd.  
Kansas City, MO 64108  
816-221-4747  
[www.dosmundos.com](http://www.dosmundos.com)

Kansas City Hispanic News  
2918 Southwest Blvd.  
Kansas City, MO 64108  
816/472-5246  
[www.kchispanicnews.com](http://www.kchispanicnews.com)

The Kansas City Globe  
615 E. 29th Street  
Kansas City, MO 64109  
816-531-5253  
[www.thekcglobe.com/about\\_us.php](http://www.thekcglobe.com/about_us.php)

St. Louis American  
4144 Lindell  
St. Louis, MO 63108  
314-533-8000  
[www.stlamerican.com](http://www.stlamerican.com)

St. Louis Chinese American News  
1766 Burns Ave, Suite 201  
St. Louis, MO 63132  
314-432-3858  
[www.scanews.com](http://www.scanews.com)

St. Louis Business Journal  
815 Olive St., Suite 100  
St. Louis, MO 63101  
314-421-6200  
[www.bizjournal.com/stlouis](http://www.bizjournal.com/stlouis)

Kansas City Business Journal  
1100 Main Street, Suite 210  
Kansas City, MO 64105  
816-421-5900  
[www.bizjournals.com/kansascity](http://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: \_\_\_\_\_

University of Missouri

INFORMATION FOR BIDDERS

Page No.

1. Contract Documents..... IFB/1  
2. Bidder's Obligation ..... IFB/1  
3. Interpretation of Documents ..... IFB/1  
4. Bids..... IFB/1  
5. Modification and Withdrawal of Bids..... IFB/2  
6. Signing of Bids ..... IFB/2  
7. Bid Security ..... IFB/2  
8. Bidder's Statement of Qualifications ..... IFB/2  
9. Award of Contract..... IFB/2  
10. Contract Execution..... IFB/2  
11. Contract Security ..... IFB/3  
12. Time of Completion ..... IFB/3  
13. Number of Contract Documents ..... IFB/3  
14. Missouri Products and Missouri Firms ..... IFB/3  
15. Supplier Diversity ..... IFB/3  
16. List of Subcontractors ..... IFB/5

**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 any thing 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 work days) 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.

The University will grant a three (3) point bonus preference to a Missouri based, certified Service Disabled Veteran Enterprise (SDVE) bidder as defined in Article 1 – (Supplier Diversity Definitions) of the General Conditions of the Contract for Construction included in the contract documents. The three percent (3%) goal can be met, and the bonus points obtained, by a qualified SDVE vendor and/or through the use of qualified SDVE subcontractors or suppliers that provide at least three percent (3%) of the total contract value. The submitted bid form must include a minimum of 3% SDVE participation to obtain the three (3) point bonus.

### **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. Bidder's 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 work day) 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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**TABLE OF ARTICLES**

	<b>PAGE</b>
<b>1. GENERAL PROVISIONS.....</b>	<b>GC/1</b>
1.1 Basic Definitions .....	GC/1
1.2 Specifications and Drawings .....	GC/3
1.3 Required Provisions Deemed Inserted.....	GC/4
<b>2. OWNER.....</b>	<b>GC/4</b>
2.1 Information and Services Required of the Owner .....	GC/4
2.2 Owner's Right to Stop the Work.....	GC/4
2.3 Owner's Right to Carry Out the Work .....	GC/4
2.4 Extent of Owner Rights .....	GC/5
<b>3. CONTRACTOR .....</b>	<b>GC/5</b>
3.1 Contractor's Warranty.....	GC/5
3.2 Compliance with Laws, Regulations, Permits, Codes, and Inspections .....	GC/5
3.3 Anti-Kickback .....	GC/6
3.4 Supervision and Construction Procedures .....	GC/6
3.5 Use of Site .....	GC/7
3.6 Review of Contract Documents and Field Conditions by Contractor.....	GC/8
3.7 Cleaning and Removal.....	GC/8
3.8 Cutting and Patching .....	GC/8
3.9 Indemnification.....	GC/9
3.10 Patents .....	GC/9
3.11 Delegated Design.....	GC/10
3.12 Materials, Labor, and Workmanship .....	GC/10
3.13 Approved Equal.....	GC/11
3.14 Shop Drawings, Product Data and Samples .....	GC/11
3.15 Record Drawings .....	GC/12
3.16 Operating Instructions and Service Manual.....	GC/13
3.17 Taxes .....	GC/13
3.18 Contractor's Construction Schedules.....	GC/14
<b>4. ADMINISTRATION OF THE CONTRACT .....</b>	<b>GC/14</b>
4.1 Rights of the Owner.....	GC/14
4.2 Rights of the Architect.....	GC/15
4.3 Review of the Work.....	GC/15
4.4 Claims.....	GC/15
4.5 Claims for Concealed or Unknown Conditions .....	GC/15
4.6 Claim for Additional Cost .....	GC/16
4.7 Claims for Additional Time.....	GC/16
4.8 Resolution of Claims and Disputes.....	GC/17
4.9 Administrative Review .....	GC/17
<b>5. SUBCONTRACTORS .....</b>	<b>GC/17</b>
5.1 Award of Subcontracts .....	GC/17
5.2 Subcontractual Relations .....	GC/18
5.3 Contingent Assignment of Subcontract .....	GC/18
<b>6. SEPARATE CONTRACTS AND COOPERATION .....</b>	<b>GC/18</b>
<b>7. CHANGES IN THE WORK.....</b>	<b>GC/19</b>
7.1 Change Orders .....	GC/19
7.2 Construction Change Directive.....	GC/20
7.3 Overhead and Profit.....	GC/20
7.4 Extended General Conditions .....	GC/21
7.5 Emergency Work.....	GC/21

<b>8. TIME .....</b>	<b>GC/21</b>
8.1 Progress and Completion.....	GC/21
8.2 Delay in Completion.....	GC/21
8.3 Liquidated Damages.....	GC/22
<b>9. PAYMENTS AND COMPLETION.....</b>	<b>GC/22</b>
9.1 Commencement, Prosecution and Completion.....	GC/22
9.2 Contract Sum .....	GC/23
9.3 Schedule of Values .....	GC/24
9.4 Applications for Payment .....	GC/24
9.5 Approval for Payment .....	GC/25
9.6 Decisions to Withhold Approval .....	GC/25
9.7 Progress Payments.....	GC/25
9.8 Failure of Payment.....	GC/26
9.9 Substantial Completion.....	GC/26
9.10 Partial Occupancy or Use .....	GC/26
9.11 Final Completion and Final Payment .....	GC/26
<b>10. PROTECTION OF PERSONS AND PROPERTY .....</b>	<b>GC/27</b>
10.1 Safety Precautions and Programs .....	GC/27
10.2 Safety of Persons and Property.....	GC/27
<b>11. INSURANCE &amp; BONDS .....</b>	<b>GC/28</b>
11.1 Insurance.....	GC/28
11.2 Commercial General Liability .....	GC/28
11.3 Licensed for Use Vehicle Liability.....	GC/29
11.4 Workers' Compensation Insurance.....	GC/29
11.5 Liability Insurance General Requirements .....	GC/29
11.6 Builder's Risk Insurance .....	GC/30
11.7 Bonds.....	GC/31
<b>12. UNCOVERING AND CORRECTION OF THE WORK.....</b>	<b>GC/32</b>
12.1 Uncovering of the Work .....	GC/32
12.2 Correction of the Work.....	GC/32
12.3 Acceptance of Nonconforming Work.....	GC/32
<b>13. MISCELLANEOUS PROVISIONS .....</b>	<b>GC/33</b>
13.1 Written Notice .....	GC/33
13.2 Rights and Remedies .....	GC/33
13.3 Tests and Inspections.....	GC/33
13.4 Nondiscrimination in Employment Equal Opportunity .....	GC/33
13.5 Supplier Diversity Goal Program .....	GC/34
13.6 Wage Rates.....	GC/34
13.7 Records.....	GC/36
13.8 Codes and Standards.....	GC/36
13.9 General Provisions.....	GC/37
13.10 Certification.....	GC/37
<b>14. TERMINATION OR SUSPENSION OF THE CONTRACT .....</b>	<b>GC/38</b>
14.1 Termination by Owner for Cause .....	GC/38
14.2 Suspension by the Owner for Convenience .....	GC/38
14.3 Owner's Termination for Convenience .....	GC/38

**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, 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 journeyman rate of pay. "Entry Level Workers; must be registered apprentices. The apprenticeship ratio will be one to one with a journeyman of the same classification. Any worker not registered as an apprentice per this section will be paid as a journeyman.

**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 date of **September 13, 2022** and entitled "**Mizzou North Demolition**"; project number **CP219078**.

b. Architect

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

c. Mechanical & Electrical Engineer

Ross & Baruzzini, Inc.  
6 South Old Orchard  
St. Louis, Missouri 63119  
Phone: 314.918.8383

d. Civil Engineer

Engineering Surveys & Services  
1113 Fay Street  
Columbia, Missouri 65201  
Phone: 573.449.2646

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

2. SPECIAL SCHEDULING REQUIREMENTS

a. Special scheduling requirements supplemental to the bid form

1. Owner has contracted with Otis Elevator to decommission elevators, including salvage of select equipment at elevators. Coordinate scheduling of elevator decommissioning activities with Otis (Tim McCray). Contractor may use elevators, at Contractor's option, upon contract award. Elevator use, safety, and maintenance shall be the Contractor's responsibility upon contract award.

2. MU Energy Management will conduct Owner salvage activities in the building to remove existing controls during the first week following contract award; this will occur after the site has been turned over to the Contractor. This shall not relieve Contractor of contractual responsibilities. Related to coordination of Owner Salvage of controls, the Contractor shall:
  - a. Coordinate controls salvage activities by Owner with Construction activities.
  - b. Protect existing controls until MU salvage of controls is complete.
  - c. Protect existing telecom rooms so that they remain fully operational until MU controls salvage is complete. Reference drawings for location(s) of telecom rooms.
  - d. Maintain and/or not shut down building systems until MU salvage of controls is complete.
  - e. Not drain down hydronic piping until MU salvage of controls is complete.
  - f. Maintain building and site security.
3. Coordinate permits for street closures and traffic control measures with City. Allow a minimum of 30 days review time for closures or lane changes lasting more than 30 days. Contractor shall be responsible for obtaining all City required permits and coordinating City permit timelines with Construction scheduling. Contractor shall be responsible for permit cost.
4. Phasing:
  - a. Phase 1: Remove single-story block garage along with associated RV pads and paving, before beginning demolition work at Mizzou North. Restore garage/RV site to sufficient condition such that the access lane to the AP Green building may remain open and unimpeded during demolition activities at Mizzou North.
  - b. Phase 2: Remove Mizzou North and adjacent paving. Active site and building demolition work to begin only after Phase 1 work is complete or by prior coordination with the Owner's Representative.
5. The existing private underground water mains within the demolition limits are in poor condition; these lines are to be capped and, per drawing notes, either removed or abandoned as part of the demolition scope. Operation and continued use of these water mains becomes the contractor's responsibility once Notice-to-Proceed is issued.

### 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 the demolition of the Mizzou North Building and adjacent single story block garage. Associated work includes:
    - a. Removal of indicated site amenities, including benches, flagpoles, bike racks, parking stops, and site signage.
    - b. Disconnection of water, gas, telecom, and electrical services to the building.
    - c. Re-feeding electrical to the existing site lighting as indicated.
    - d. Rough grading of site.
    - e. Restoration of parking areas and all paving to remain to as-existing pre-demolition condition(s) or better.

#### 4. LOCATION

Work shall be performed under this Contract on campus of the University of Missouri – Columbia, at Mizzou North, 115 W Business Loop 70.

#### 5. NUMBER OF CONSTRUCTION DOCUMENTS

- a. 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.3) for required submittal information.

d. The Contractor shall submit to the Owner's Representative all items referenced in the accompanying Closeout Log (1.E.5) 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 to park in location directed by the Owner's Representative. 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 contractor's 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: Water, sewer, and electricity can be obtained from existing site utilities at locations designated by the Owner's Representative. Contractor is responsible for purchasing required utilities at City of Columbia rates. Additional information may be found at:

City of Columbia Water Fees:

[https://library.municode.com/mo/columbia/codes/code\\_of\\_ordinances?nodeId=COORCOMI\\_CH27UT\\_ARTIIIWALISY\\_DIV2WASE\\_S27-52WASELIWNAPFE](https://library.municode.com/mo/columbia/codes/code_of_ordinances?nodeId=COORCOMI_CH27UT_ARTIIIWALISY_DIV2WASE_S27-52WASELIWNAPFE)

Provisions for obtaining power, including temporary extensions, shall be furnished and maintained by the Contractor. Upon completion of the work, such extensions shall be removed, and any damage caused by use of such extensions shall be repaired to the 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" after evaluation by a competent person; 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 canceled 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 canceling 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 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 all corner and gate posts fastened to the concrete. All other posts shall be sufficiently secured in ground to maintain proper and adequate support of fence. Fenced in area(s) shall have at least two (2) access gates and all gates shall be lockable and include provisions for emergency vehicle access via Knox Box or similar device. Refer to drawings for additional detail.
- (2) Fence screening fabric shall be used on all perimeter fencing. Fabric shall be black 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. 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. The following codes and standards shall also apply:

- a. City of Columbia - Sewer Line Installation Standards - Department of Public Works

“All sanitary sewer construction shall be in accordance with the City of Columbia Specifications and Standards and in conformance with the rules and regulations of the Missouri Clean Water Commission.”

12. SPECIALTIES

- a. Owner furnished topsoil: The Owner will place the topsoil and provide final grade. The contractor shall rough grade to the following specification:
- (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 at 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.

13. PRE-BID INSPECTION

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

14. 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.

15. 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.
- (2) Add to the Insurance Requirements in General Conditions Article 11, Pollution Liability Coverage, for specified hazardous waste disposal 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 Hazardous Waste Disposal Subcontractor and/or Hauler in lieu of the General Contractor subject to all requirements set forth in article 11.
- (3) Reference: General Conditions Article 11.2.1 Commercial General Liability.

Delete in the first sentence of 11.2.1: "\$2,000,000 per occurrence, \$5,000,000 in general aggregate, \$5,000,000 products and completed operations aggregate and \$1,000,000 personal injury and advertising injury" and insert: "\$2,000,000 per occurrence, \$10,000,000 in general aggregate, \$10,000,000 products and completed operations aggregate and \$1,000,000 personal injury and advertising injury"

16. 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.

Project Controlled Scheduling- Contractor is responsible for the schedule. However, University shall hire a Third-Party Scheduling Consultant, at the University's expense. See Project Controlled Scheduling Specification included in these documents.

17. PROJECT MANAGEMENT/COMMUNICATION REQUIREMENTS

- a. The Contractor shall be represented at the site by both a competent Project Manager and a full-time, competent superintendent with no other assigned duties or responsibilities from the beginning of the work until its final acceptance, unless otherwise permitted by the Owner's Representative. The superintendent for the

Contractor for the general building work shall exercise general supervision over all subcontractors of any tier engaged on the work with decision-making authority of the Contractor.

- b. The Contractor shall use a current industry standard (Primavera, Microsoft Project, etc.) project scheduling software which provides as a minimum: Critical paths, milestones, estimated and actual start and completion dates, scheduled vs. actual progress, and detailed task and subtask breakdown. The following schedules shall be provided as a minimum and kept current: Overall project schedule, four- (4-) week look-ahead, and two- (2-) week look-ahead.
- c. The Contractor shall furnish on-site Internet access for use by his Project Manager and superintendent. . The contractor shall utilize the Owner's secure information sharing system for submittals, construction payment process, change orders, RFI's/ASI's, O&M manuals and all other project manual requirements as directed by the Owner's Representative. Field staff are also required to utilize this software as directed by the Owner's Representative.

#### 18. SAFETY PRECAUTIONS AND PROGRAMS

- a. The Bidder's Statement of Qualifications includes a requirement that the Bidder provide its Worker's Compensation Experience Modification Rates (EMR) and Incidence Rates for the three recent years. The Bidder shall also include the EMR and Incidence Rates of listed major subcontractors on the Bid for Lump Sum Contract. If the EMR exceeds 1 or the Incidence Rate exceeds 13, the Contractor or major subcontractor shall take additional safety measures including, but not limited to, developing a site-specific safety plan and assigning a Safety Manager to the Project to perform inspections on a schedule as determined acceptable by the Owner with written reports to be submitted to the Owner. The Owner reserves the right to reject a Bidder or major subcontractor whose rates exceed these stated rates.
- b. 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.

#### 19. 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. Special hot work requirements: Use thermal imaging cameras after hot work operations- describe criteria in detail (for historically significant buildings of wood construction); designate additional fire watch monitoring beyond the NFPA 30-minute post hot work requirement (project has a greater potential for reflash or smoldering fire due to concealed combustible building elements, etc.).

## 20. 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.

21. 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**



# Project Controlled Scheduling

## 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 insure 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) Project Controlled Scheduling  
The content (Activity Descriptions, Activity Codes, Durations, Predecessors and Successors) of the Project Schedule will be the responsibility of the Contractor. However, the University will provide the services of a Third Party Scheduling Consultant (TPSC), at the University's expense, to prepare and maintain the CPM schedule program for the duration of the project. Upon

Contractor's compliance with the requirements listed below, TPSC will take responsibility for organizing the Project CPM schedule, which reflects the Contractor's plan, using Primavera Project Planner (P3) or Oracle 6, in a manner that complies with this section of the Special Conditions.

c) Contractor Requirements

(1) Schedule Development

Contractor shall fully cooperate with the TPSC Consultant to make personnel available to describe the Contractor's plan for executing the work. Personnel shall be made available as noted for the series of meetings/working sessions listed below.

(2) Schedule Strategy (Week 1-2)

Within 10 days of award, the Project Executive, Project Manager, Project Engineer(s) and Project Superintendent (Contractor Team) will meet with TPSC to establish the general plan and sequencing of the project. At this meeting, the Contractor Team will agree upon the overall work plan, commit to the level of detail to be included in the schedule, the number of activity codes necessary for effective project control, the necessity of cost loading and/or crew loading the schedule. It is anticipated that this meeting(s) will take between 2 and 4 hours.

(3) Activity Identification and Logic Development (Weeks 3-4)

During the two weeks following the Strategy Meeting, Contractor will make the Project Team (minimum of Project Manager and Project Superintendent) available, up to ½ time, to identify the specific activities that will be included in the schedule and determine the specific logic that the contractor intends to follow in constructing the project. This effort is normally accomplished in a few ½ day sessions, with the TPSC facilitating the discussion and recording the plan. The Project Team will provide preliminary durations for all activities, including those of subcontractors. Final durations will be developed after receiving input from the major subcontractors and/or craft superintendents, during the Schedule Reconciliation Phase described below.

Contractor will provide TPSC with a complete submittal list, from which the TPSC and Project Team will determine which submittals and procurement activities are necessary to include in the CPM schedule in order to effectively manage the project.

(4) Schedule Development (Weeks 5)

During Week #5 TPSC will produce a Preliminary Schedule "fragnet" or "subnet" that describes the work plan for the first 90 days of the project. This "fragnet" will be used to monitor the work on the project until the final schedule is prepared and accepted by the University and the Project Team.

By the end of week 5, the TPSC will have all of the identified activities, durations, logic and activity codes input into the schedule, ready to review with each major subcontractor and/or craft superintendent.

Contractor will distribute one full copy of the schedule and one copy of each individual subcontractors scheduled activities to each subcontractor for review.

(5) Subcontractor Review (Week 6)

(6) Schedule Reconciliation (Week 7)

Contractor will arrange a series of meetings with each major subcontractor and/or craft superintendent. Project Manager and/or Project Superintendent must be present at each meeting. Meetings should take between 1 to 2 hours, depending on the subcontractor's scope, capability and work complexity. Upon completion of this series of meetings, each subcontractor's reconciled schedule will be printed out and the subcontractor will sign the printout, signifying its commitment to performing in accordance with the reconciled schedule.

(7) Final Schedule Development (Week 8)

During this time frame, TPSC and Project Team will secure subcontractor commitment to the finished schedule. TPSC will finalize all agreed upon activity coding and resource loading. TPSC will print out the final schedule, including various "fragnets" for review by the entire Project Team, TPSC and the University, at a Schedule Finalization Meeting, to be held prior to final acceptance of the schedule by the entire Project Team.

(8) Schedule Updates.

(a) Schedule Updates will be conducted once a month, at a minimum. TPSC will provide Contractor with a "Schedule Update Form", which contains blanks for Actual Start and Actual Finish dates, Percent Complete and Remaining Duration. 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 submit completed update form to TPSC.

(c) TPSC will copy the previous months schedule and will input update information into the new monthly update version.

(d) TPSC will meet with Contractor to review the draft of the updated schedule. At this meeting, TPSC and Contractor will:

(i) Review out of sequence progress, making adjustments as necessary,

(ii) Add any fragnets 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.

(9) Schedule Narrative

After finalization of the update, the TPSC 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.

(10) 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.
- b) Critical Path: The longest continuous chain of activities through the network schedule that establishes the minimum overall project duration.
- c) Network Diagram: A graphic diagram of a network schedule, showing the activities and activity relationships.
- d) 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.
- e) Critical activities are activities on the critical path.
- f) Predecessor activity is an activity that must be completed before a given activity can be started.
- g) Milestone: A key or critical point in time for reference or measurement.
- h) 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.
- i) Total float is herein defined as the measure of leeway in starting or completing an activity without adversely affecting the planned project completion date.
- j) 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.
- k) Force Majeure Event: Any event that delays the project but is beyond the control and/or contractual responsibility of either party.
- l) Schedule shall including 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.
    - (h) 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.

### 1. TIME EXTENSION REQUESTS

- 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 shall work with the TPSC to 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: Mizou North Demolition  
 Project Number: MU No. CP 219078 / PWA 202214  
 Contractor:

Section	Submittal No.	Contractor	Action					Remarks	Date Returned	Copies		
			Date Received	#	Date Sent to Consultant	#	Date Returned			Cont'r	Owner	File
01 7419	CONSTRUCTION WASTE MANAGEMENT											
02 0810	UNIVERSAL WASTES/OTHER ENVIRONMENTAL CONCERNS REMOVAL AND DISPOSAL											
02 4100	DEMOLITION											
02 8233	FRIABLE AND NON-FRIABLE ASBESTOS REMOVAL											
22 1313	FACILITY SANITARY SEWERS											
26 0543	UNDERGROUND DUCTS, RACEWAYS, AND UTILITY STRUCTURES											
26 0923	LIGHTING CONTROL DEVICES											
26 2416	PANELBOARDS											

### SHOP DRAWING AND SUBMITTAL LOG

Section	Submittal No.	Contractor	Action					Remarks	Date Returned	Copies		
			Date Received	#	Date Sent to Consultant	#	Date Returned			Cont'r	Owner	File
31 1000	SITE CLEARING											
	Pre-Demolition Photographs or video - coordinate with submittal requirements of Section 02 4100 Demolition											
31 2000	EARTH MOVING											
	Product Data - Warning Tapes											
	Samples - Warning Tapes											
	Material Test Reports											
32 1216	ASPHALT PAVING											
	Product Data (Mix Design)											
	Qualification Data											
	Material Certificates											
	Material Test Reports											
32 1313	CONCRETE PAVING											
	Product Data (Mix Design)											
	Qualification Data											
	Material Certificates											
	Material Test Reports											
32 1373	CONCRETE PAVING JOINT SEALANTS											
	Product Data (Joint Sealants)											
	Product Data (Joint Backing Materials)											
	Samples											
	Paving Joint Sealant Schedule											
33 1415	SITE WATER DISTRIBUTION PIPING											
	Product Data											
33 4200	STORM WATER CONVEYANCE											
	Shop Drawings											

## CLOSEOUT LOG

Project: Mizzou North Demolition

Project Number: MU No. CP 219078 / PWA 202214

Contractor:

Section	Description	Contractor / Subcontractor	Date Rec/d	# of Copies	CPM Initials	Remarks
GC /3.14; 02 4100	As-built drawings (Field Redlines)					
01 7419	Waste Management Final Report					
02 0810	Universal Wastes/Other Environmental Concerns Removal and Disposal - Shipping Records, Receipts, Waste Tickets, Incineration Information					
02 8233	Friable and Non-Friable Asbestos Removal - Shipping Records, Receipts, Waste Tickets, Incineration Information					
26 0500	Warranties					
26 0543	As-built drawings - Show dimensioned locations of underground ducts and handholds					
26 2416	Spare keys for panelboard locks					
26 2416	Warranties					



SECTION 1.F

INDEX OF DRAWINGS

Drawings referred to in and accompanying Project Manual consist of following sheets dated September 13, 2022.

CP219078 Mizzou North Demolition

Sheet	1	of	38	G001	COVER SHEET
Sheet	2	of	38	G002	LOCATION MAPS, LIST OF DRAWINGS, CODES
Sheet	3	of	38	G003	SALVAGE ITEMS MATRIX
Sheet	4	of	38	G004	SALVAGE - REFERENCE FLOOR PLANS
Sheet	5	of	38	V1.01	(REFERENCE ONLY:) BOUNDARY & TOPOGRAPHIC SURVEY
Sheet	6	of	38	V1.02	(REFERENCE ONLY:) BOUNDARY & TOPOGRAPHIC SURVEY
Sheet	7	of	38	V1.03	(REFERENCE ONLY:) BOUNDARY & TOPOGRAPHIC SURVEY
Sheet	8	of	38	V1.04	(REFERENCE ONLY:) BOUNDARY & TOPOGRAPHIC SURVEY
Sheet	9	of	38	V1.05	(REFERENCE ONLY:) BOUNDARY & TOPOGRAPHIC SURVEY
Sheet	10	of	38	V1.06	(REFERENCE ONLY:) BOUNDARY & TOPOGRAPHIC SURVEY
Sheet	11	of	38	V1.07	(REFERENCE ONLY:) BOUNDARY & TOPOGRAPHIC SURVEY
Sheet	12	of	38	D101	DEMOLITION PLAN & EXISTING PHOTOS
Sheet	13	of	38	C0.01	COVER & GENERAL NOTES
Sheet	14	of	38	C1.01	TEMPORARY TRAFFIC CONTROL PLAN
Sheet	15	of	38	C1.02	TEMPORARY TRAFFIC CONTROL PLAN
Sheet	16	of	38	C2.01	OVERALL EROSION CONTROL PLAN
Sheet	17	of	38	C3.01	OVERALL SCOPE & KEY PLAN
Sheet	18	of	38	C4.01	PHASE 1 DEMOLITION PLAN
Sheet	19	of	38	C4.02	PHASE 2 DEMOLITION PLAN
Sheet	20	of	38	C4.03	PHASE 2 DEMOLITION PLAN
Sheet	21	of	38	C4.04	PHASE 2 DEMOLITION PLAN
Sheet	22	of	38	C4.05	PHASE 2 DEMOLITION PLAN
Sheet	23	of	38	C4.06	PHASE 2 DEMOLITION PLAN
Sheet	24	of	38	C5.01	FINAL SITE PLAN AFTER DEMOLITION
Sheet	25	of	38	C5.02	FINAL SITE PLAN AFTER DEMOLITION
Sheet	26	of	38	C5.03	FINAL SITE PLAN AFTER DEMOLITION
Sheet	27	of	38	C5.04	FINAL SITE PLAN AFTER DEMOLITION
Sheet	28	of	38	C5.05	FINAL SITE PLAN AFTER DEMOLITION
Sheet	29	of	38	C6.01	PHASE 1 GRADING PLAN
Sheet	30	of	38	C6.02	PHASE 2 GRADING PLAN
Sheet	31	of	38	C7.01	SITE & EROSION CONTROL DETAILS
Sheet	32	of	38	C8.01	TEMPORARY TRAFFIC CONTROL DETAILS
Sheet	33	of	38	E000	ELECTRICAL SYMBOLS, AND ABBREVIATIONS
Sheet	34	of	38	E101	ELECTRICAL DEMOLITION PLAN - NORTH
Sheet	35	of	38	E102	ELECTRICAL DEMOLITION PLAN - SOUTH
Sheet	36	of	38	E201	ELECTRICAL NEW WORK PLAN - NORTH
Sheet	37	of	38	E202	ELECTRICAL NEW WORK PLAN - SOUTH
Sheet	38	of	38	E300	ELECTRICAL DETAILS

END OF SECTION

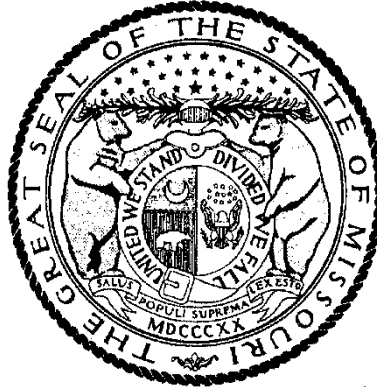
SECTION 1.G

PREVAILING WAGE RATES

# Missouri

## Division of Labor Standards

### WAGE AND HOUR SECTION



MICHAEL L. PARSON, Governor

# Annual Wage Order No. 29

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, 2022**

Last Date Objections May Be Filed: **April 11, 2022**

Prepared by Missouri Department of Labor and Industrial Relations

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Asbestos Worker	\$58.66
Boilermaker	\$30.87*
Bricklayer	\$51.43
Carpenter	\$48.35
Lather	
Linoleum Layer	
Millwright	
Pile Driver	
Cement Mason	\$41.91
Plasterer	
Communications Technician	\$55.88
Electrician (Inside Wireman)	\$55.87
Electrician Outside Lineman	\$75.58
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Elevator Constructor	\$30.87*
Glazier	\$47.32
Ironworker	\$62.10
Laborer	\$41.12
General Laborer	
First Semi-Skilled	
Second Semi-Skilled	
Mason	\$48.56
Marble Mason	
Marble Finisher	
Terrazzo Worker	
Terrazzo Finisher	
Tile Setter	
Tile Finisher	
Operating Engineer	\$60.81
Group I	
Group II	
Group III	
Group III-A	
Group IV	
Group V	
Painter	\$37.40
Plumber	\$67.36
Pipe Fitter	
Roofer	\$52.11
Sheet Metal Worker	\$53.28
Sprinkler Fitter	\$62.30
Truck Driver	\$30.87*
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 Section 290.210 RSMo.

Heavy Construction Rates for  
BOONE County

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Carpenter	\$51.63
Millwright	
Pile Driver	
Electrician (Outside Lineman)	\$75.58
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Laborer	\$46.46
General Laborer	
Skilled Laborer	
Operating Engineer	\$58.48
Group I	
Group II	
Group III	
Group IV	
Truck Driver	\$30.87*
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. 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 Section 290.210 RSMo.

# 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.

**Stormwater Pollution Prevention Plan  
for Construction Activities at:**

**MIZZOU NORTH DEMOLITION**

University of Missouri Project #CP219078  
115 W. Business Loop 70  
Columbia, Missouri 65203

**Operator(s):**

The Curators of the University of Missouri  
180 General Services Building  
Columbia, Missouri 65211  
Contact: Ted Haeussler 573-882-7018

**SWPPP Authorized Representative(s):**

*(to be filled in by Contractor after award of contract)*

Company Name: \_\_\_\_\_  
Company Address: \_\_\_\_\_  
\_\_\_\_\_  
Contact Name: \_\_\_\_\_  
Contact Phone: \_\_\_\_\_

**Prepared by:**

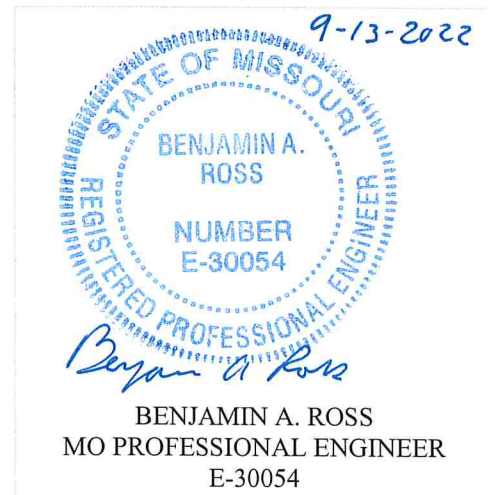
*Engineering Surveys & Services*  
1113 Fay Street  
Columbia, MO 65201  
Phone: 573-449-2646  
Missouri Engineering Corp. # 2004005018

Project Number: 15655

**SWPPP Preparation Date:**

September 13, 2022

*Estimated Project Dates:*  
**Project Start Date:** October 2022  
**Project Completion Date:** October 2023



**TABLE OF CONTENTS**

**SECTION 1: SWPPP BASICS..... 1**

1.1 GENERAL PERMITS FOR STORMWATER DISCHARGE FROM CONSTRUCTION SITES ..... 1

1.2 BEST MANAGEMENT PRACTICES ..... 1

1.3 PURPOSE OF STORMWATER POLLUTION PREVENTION PLAN ..... 1

1.4 NOTICE OF INTENT..... 1

1.5 AUTHORIZED REPRESENTATIVE..... 2

1.6 RESPONSIBILITIES OF THE CONTRACTOR ..... 2

1.7 RESPONSIBILITIES OF THE CONTRACTOR TO OPERATOR ..... 2

1.8 AUTHORIZED REPRESENTATIVE AND SUBCONTRACTORS CERTIFICATION ..... 2

1.9 ONSITE REQUIREMENTS AND PUBLIC NOTICE..... 2

**SECTION 2: COMPLIANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS ..... 3**

2.1 GENERAL..... 3

**SECTION 3: SITE EVALUATION, ASSESSMENT, AND PLANNING..... 3**

3.1 PROJECT/SITE INFORMATION..... 3

3.2 CONTACT INFORMATION/RESPONSIBLE PARTIES ..... 4

3.3 NATURE AND SEQUENCE OF CONSTRUCTION ACTIVITY..... 5

3.4 SOILS, SLOPES, VEGETATION, AND CURRENT DRAINAGE PATTERNS ..... 5

3.5 CONSTRUCTION SITE ESTIMATES ..... 6

3.6 RECEIVING WATERS..... 6

3.7 JURISDICTIONAL WETLANDS AND/OR OTHER SURFACE WATERS ..... 6

3.8 SITE FEATURES AND SENSITIVE AREAS TO BE PROTECTED..... 6

3.9 POTENTIAL SOURCES OF POLLUTION ..... 7

3.10 ENDANGERED SPECIES CERTIFICATION ..... 8

3.11 HISTORIC PRESERVATION ..... 8

3.12 APPLICABLE FEDERAL, TRIBAL, STATE OR LOCAL PROGRAMS..... 8

3.13 MAPS ..... 8

**SECTION 4: EROSION AND SEDIMENT CONTROL BMPS ..... 9**

**SECTION 1: 9**

4.1 GENERAL..... 9

4.2 MINIMIZE DISTURBED AREA AND PROTECT NATURAL FEATURES AND SOIL ..... 10

4.3 PHASE CONSTRUCTION ACTIVITY ..... 11

4.4 TEMPORARY STRUCTURAL BMPS ..... 11

4.5 PERMANENT NON-STRUCTURAL BMPS..... 13

4.6 TEMPORARY NON-STRUCTURAL BMPS ..... 15

4.7 ADDITIONAL BMPS ..... 18

**SECTION 5: GOOD HOUSEKEEPING BMPS..... 19**

5.1 MATERIAL HANDLING AND WASTE MANAGEMENT..... 19

5.2 ESTABLISH PROPER BUILDING MATERIAL STAGING AREAS..... 22

5.3 ESTABLISH PROPER EQUIPMENT/VEHICLE FUELING AND MAINTENANCE PRACTICES..... 23

5.4 CONTROL EQUIPMENT/VEHICLE WASHING ..... 23

5.5 SPILL PREVENTION AND CONTROL PLAN..... 23

5.6 ANY ADDITIONAL BMPS..... 25

5.7 ALLOWABLE NON-STORMWATER DISCHARGE MANAGEMENT ..... 25

**SECTION 6: INSPECTIONS..... 25**

6.1 ROUTINE INSPECTIONS..... 25

6.2 NON ROUTINE/SPOT INSPECTIONS ..... 26

6.3 FINAL STABILIZATION ..... 26

6.4 BMP INSPECTORS..... 26

6.5 DESIGNATED INSPECTORS ..... 26

**SECTION 7: RECORDKEEPING AND TRAINING ..... 28**

7.1 RECORDKEEPING..... 28

7.2 LOG OF CHANGES TO THE SWPPP ..... 30

7.3 TRAINING ..... 30

**SECTION 8: TERMINATION OF PERMIT COVERAGE ..... 31**



## SWPPP APPENDICES

- APPENDIX A: LAND DISTURBANCE PERMIT(S)
- APPENDIX B: \*NOT USED\*
- APPENDIX C: AUTHORIZED REPRESENTATIVE DESIGNATION
- APPENDIX D: AUTHORIZED REPRESENTATIVE CERTIFICATION
- APPENDIX E: LIST OF SUBCONTRACTORS
- APPENDIX F: SUBCONTRACTORS CERTIFICATION
- APPENDIX G: IMPLEMENTATION SCHEDULE
- APPENDIX H: INSPECTION REPORT FORM
- APPENDIX I: SWPPP AMENDMENT REPORT FORM & OVERALL SWPPP AMENDMENT LOG
- APPENDIX J: GENERAL LOCATION MAP
- APPENDIX K: CONSTRUCTION SITE NOTICES
- APPENDIX L: RECORD OF PERSONNEL TRAINING ACTIVITIES FORM
- APPENDIX M: REPORTABLE QUANTITY RELEASE FORM
- APPENDIX N: RECORD OF RAINFALL
- APPENDIX O: NOTICE OF TERMINATION(S) & FINAL STABILIZATION/TERMINATION CHECKLIST
- APPENDIX P: TMDL DOCUMENTATION 303(D) IMPAIRED WATERWAY

## **SECTION 1: SWPPP BASICS**

---

### **1.1 GENERAL PERMITS FOR STORMWATER DISCHARGE FROM CONSTRUCTION SITES**

The Clean Water Act and associated federal regulations require nearly all construction site operators engaged in clearing, grading, and excavating activities that disturb one acre or more, including smaller sites in a larger common plan of development or sale, to obtain coverage under a National Pollutant Discharge Elimination System (NPDES) permit for their stormwater discharges. Under the NPDES program, the U.S. Environmental Protection Agency (EPA) has authorized the State of Missouri to implement the federal requirements and issue stormwater permits. The Missouri Department of Natural Resources (MDNR), as administrative agent for the Missouri Clean Water Commission, issues these permits as land disturbance permits. To obtain the permit for compliance with the regulations for land disturbance it is necessary to request coverage under the MDNR Missouri State Operating Permit – General Permit. The permit was obtained through MDNR’s ePermitting process available online and is included in Appendix A.

The construction plan(s) consists of two parts: site grading and erosion control map(s)/plan(s), and a site-specific written document that identifies and describes stormwater pollution sources and prevention methods referred to as a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP for the site must be prepared and followed during construction activities in accordance with the state NPDES Permit and local City requirements. Plans and SWPPP must be approved by the City prior to commencement of construction activities.

### **1.2 BEST MANAGEMENT PRACTICES**

If sediment and erosion controls and good housekeeping practices are not followed, construction activity can result in the discharge of significant amounts of sediment and other pollutants via stormwater runoff. The term Best Management Practices or BMPs is often used to describe the controls and activities used to prevent stormwater pollution. BMPs can be divided into two main categories – structural and non-structural BMPs. Structural BMPs include silt fences, sedimentation ponds, erosion control blankets, and temporary or permanent seeding, while non-structural BMPs include picking up trash and debris, sweeping up nearby sidewalks and streets, maintaining equipment, and training site staff on erosion and sediment control practices. In this document, the term “BMPs” is used broadly and includes both structural and non-structural controls and practices.

### **1.3 PURPOSE OF STORMWATER POLLUTION PREVENTION PLAN**

The purpose of the SWPPP is to ensure the design, implementation, management, and maintenance of BMPs in order to reduce the amount of sediment and other pollutants in storm water discharges associated with the land disturbance activities; comply with Missouri Water Quality Standards; and ensure compliance with the terms and conditions of the land disturbance permits(s). Copies of these permits shall be included in Appendix A. The SWPPP document shall:

- Identify potential sources of stormwater pollution at the construction site
- Describe practices to reduce pollutants in storm water discharges from the construction site.
- Identify procedures the Operator will implement to comply with the terms and conditions of the land disturbance permit(s).

### **1.4 NOTICE OF INTENT**

The Operator has petitioned for storm water discharges associated with the land disturbance activities at this site to be covered by Missouri’s MDNR Operating Permit – General Operating Permit. The MDNR permit was obtained through MDNR’s ePermitting process available online and is included in Appendix A. This serves as the Notice of Intent (NOI) for the project.

## **1.5 AUTHORIZED REPRESENTATIVE**

All reports, including SWPPPs and inspection reports, must be signed by the Operator or a duly authorized representative of that entity. For this project the Operator has chosen to designate the Contractor as an authorized representative as indicated in the signed statement located in Appendix C.

## **1.6 RESPONSIBILITIES OF THE CONTRACTOR**

The authorized representative, or Contractor, shall be responsible for the management of the discharge of stormwater from the site in accordance with the Missouri NPDES General State Operating Permit conditions and the provisions of this SWPPP. The Contractor shall be responsible for implementing all aspects of this SWPPP and conducting the stormwater management practices in accordance with the permit(s). The Contractor shall be responsible for providing qualified inspectors to conduct the inspections required by this SWPPP and for notifying each subcontractor or entity (including utility crews and city employees or their agents) who will perform work at the site of the existence of the SWPPP and what actions or precautions shall be taken while on site to minimize the potential for erosion and damage to BMPs. The Contractor shall be responsible for any enforcement action taken or imposed by federal, state, or local agencies, including the cost of fines, construction delays, and remedial actions resulting from the Contractor's failure to comply with the permit provisions. It shall be the responsibility of the Contractor to make any changes to the SWPPP necessary when the Contractor or any of his subcontractors elects to use borrow or fill or material storage sites, either contiguous to or remote from the construction site, when such sites are used solely for this construction site. Such sites are considered to be part of the construction site covered by the permit and this SWPPP. Off-site borrow, fill, or material storage sites which are used for multiple construction projects are not subject to this requirement, unless specifically required by state or local jurisdictional entity regulations. The Contractor should consider this requirement in negotiating with earthwork subcontractors, since the choice of an off-site borrow, fill, or material storage site may impact their duty to implement, make changes to, and perform inspections required by the SWPPP for the site.

## **1.7 RESPONSIBILITIES OF THE CONTRACTOR TO OPERATOR**

The Contractor shall monitor the suitability of the designated management practices to achieve the stormwater quality provisions of the permit(s), and shall notify the Operator of the need to change management practices if necessary. If changes are ordered by the Operator, an adjustment in the Contractor's fee shall be considered in accordance with the General Conditions of the specifications. However, the Contractor's failure to monitor or report deficiencies to the Operator shall result in the Contractor being liable for fines and construction delays resulting from any federal, state, or local agency enforcement action.

## **1.8 AUTHORIZED REPRESENTATIVE AND SUBCONTRACTORS CERTIFICATION**

The SWPPP Authorized Representative Certification must bear the signature of an authorized representative of the Contractor certifying that they are familiar with the terms and conditions of the MDNR Operating Permit – General Operating Permit and shall comply with the requirements of the SWPPP developed for this construction site. The Authorized Representative is responsible for ensuring that all contractors and subcontractors whose activities provide the potential for storm water pollution comply with the SWPPP. Some Contractors require each subcontractor whose activities provide the potential for storm water pollution to sign the SWPPP Subcontractor's Certification and make the same certification as the Authorized Representative. These forms are located in Appendixes C and D of this document. Copies of these pages shall be created as necessary to accommodate all subcontractors for this project. For easier tracking, a List of Subcontractors is provided in Appendix E to be filled out by the Contractor. All of the signed forms shall be kept in Appendixes C thru F as part of this document.

## **1.9 ONSITE REQUIREMENTS AND PUBLIC NOTICE**

The Contractor shall keep a copy of the SWPPP maps and the SWPPP with all related documents onsite when land disturbance operations are in progress, or other operational activities that may affect the maintenance or integrity of the BMP structures are in progress. The SWPPP must be made available to any stormwater regulatory authorities upon request.

The Contractor shall post and maintain a copy of the public notification information required in the MDNR Land Disturbance Permit included in Appendix A and the notice included in Appendix K at the main entrance to the site. The public notification sign must be visible from the public road that provides access to the site's main entrance. The public notification sign must remain posted at the site until the permit has been terminated.

## SECTION 2: COMPLIANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS

### 2.1 GENERAL

The Contractor shall obtain copies of any and all federal, state, and local regulations that are applicable to stormwater management, erosion control, and pollution minimization at this job site and shall comply fully with such regulations. The Contractor shall submit written evidence of such compliance if requested by the Operator or any agent of a regulatory body. The Contractor shall comply with all conditions of the MDNR Operating Permit – General Operating Permit, including the conditions related to maintaining the SWPPP and evidence of compliance with the SWPPP at the job site and allowing regulatory personnel access to the job site and to records in order to determine compliance.

## SECTION 3: SITE EVALUATION, ASSESSMENT, AND PLANNING

### 3.1 PROJECT/SITE INFORMATION

Project/Site Name: Mizzou North Demolition

Project Street/Location: 115 W. Business Loop 70

City: Columbia

State: MO

ZIP Code: 65211

County or Similar Subdivision: Boone County

Latitude/Longitude:

Latitude:

38° 58' 03" N (degrees, minutes, seconds)

Longitude:

92° 20' 22" W (degrees, minutes, sec)

Method for determining latitude/longitude:

USGS topographic map (specify scale: \_\_\_\_\_)

EPA Web site

GPS

Other (please specify): Google Earth

Is the project located in Indian country?  Yes  No

If yes, name of Reservation, or if not part of a Reservation, indicate "not applicable." N/A

Is this project considered a federal facility?  Yes  No

NPDES project or permit tracking number\*: MOR100039

*\*(contractor hand write in MDNR General Operating Permit number from Appendix A)*

A general location map (i.e., USGS 1"=2000' quadrangle map) with enough detail to identify the location of the construction site, direction of storm water flow, the receiving water within one (1) mile of the site, locations of off-site material, waste, borrow, and equipment storage areas, surface waters and wetlands, and storm water discharge locations as required by MDNR is included in Appendix J.

### 3.2 CONTACT INFORMATION/RESPONSIBLE PARTIES

**Operator(s):**

The Curators of University of Missouri  
180 General Services Building  
Columbia, Missouri 65211  
Contact: Ted Haeussler  
Phone: (573) 882-7018  
Email: haeusslert@missouri.edu

**SWPPP Authorized Representative(s) (can be: general contractor: project/construction manager(s) or site supervisor(s); see also APPENDIX C):** *(to be filled in by Contractor after award of contract)*

Company or Organization Name: \_\_\_\_\_

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

City, State, Zip Code: \_\_\_\_\_

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

Contact Telephone Number: \_\_\_\_\_

Contact Email: \_\_\_\_\_

Insert area of control (if more than one operator at site) : \_\_\_\_\_

\_\_\_\_\_

**General Contractor: (can be Project/Construction Manager(s) or Site Supervisor(s)):**  
*(to be filled in by Contractor after award of contract)*

Company or Organization Name: \_\_\_\_\_

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

City, State, Zip Code: \_\_\_\_\_

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

Contact Telephone Number: \_\_\_\_\_

Contact Email: \_\_\_\_\_

Insert area of control (if more than one operator at site): \_\_\_\_\_

\_\_\_\_\_



other quarter of the lot drains to the south where it enters the City of Columbia storm sewer system. Post project the site will drain in the same fashion.

Vegetation: Pre project the site consisted of impervious areas, and landscaped/turf green space areas. Post project the site will consist less impervious areas, more landscaped/turf green space areas, and landscaping.

Other: None.

### 3.5 CONSTRUCTION SITE ESTIMATES

The following are estimates of the construction site.

Total site area:	37.07 acres
Construction project area to be disturbed:	3.10 acres
Percentage impervious area before construction:	90.0 %
Runoff coefficient before construction:	0.84
Percentage impervious area after construction:	0.0 %
Runoff coefficient after construction:	0.30

$$[0.30(3.10 \text{ acres}) + 0.90(0.00 \text{ acres})] / 3.10 \text{ acres} = 0.30$$

Estimated off-site borrow and fill areas: 9,000 C.Y.

### 3.6 RECEIVING WATERS

Description of receiving waters: This was developed on a ridgetop thus there are two different receiving waters from this site. An unnamed tributary of Flat Branch and an unnamed tributary of Bear Creek. These waters are not listed by MDNR as 303d impaired waters or waters subject to Total Maximum Daily Loads (TMDLs). Verification can be found with the current 303d List printed from the MDNR website and placed in Appendix P.

Description of receiving storm sewer systems: City of Columbia storm sewer system.

Stormwater velocity reduction methods at outfall(s): No new outfalls are proposed in this development.

### 3.7 JURISDICTIONAL WETLANDS AND/OR OTHER SURFACE WATERS

There are no jurisdictional wetlands and/or other surface waters within the project limits as the project consist of building and parking lot demolition only.

### 3.8 SITE FEATURES AND SENSITIVE AREAS TO BE PROTECTED

There is potential of sensitive areas within the project area this includes the underground storage tank and potential hazardous materials. See the site plan for tank locations and reference contract documents for additional information on hazardous materials.

### 3.9 POTENTIAL SOURCES OF POLLUTION

Sediment is the principal stormwater pollutant of concern for this project. There are, however, other pollutants that may be found, usually in substantially smaller amounts, in stormwater runoff from construction sites. Potential sources of pollutants to stormwater runoff from this project are noted in the following table:

Potential Construction Site Pollutants										
Possible Source	Pollutants									Location
	Sediment	Nutrients	Heavy Metals	pH (acids & bases)	Pesticides & herbicides	Oil & grease	Bacteria & viruses	Trash, debris, solids	Other toxic chemicals	
Clearing & Grubbing	X							X		Within clearing limits
Grading & site excavation	X									Within grading limits
Vehicle Tracking	X					X				Construction roads onsite and/or nearest public roadway(s) providing site access
Topsoil stripping & stockpiling	X									Within grading limits
Paving Operations	X							X		Paving areas
Concrete washout & waste			X	X				X		Designated concrete wash out area(s)
Structure construction/painting/cleaning		X		X				X	X	Structure location(s) & designated wash out area(s)
Demolition and debris disposal	X							X		Demo areas
Dewatering operations	X	X								Where necessary. Typically footing and trenching locations.
Drilling and blasting operations	X			X				X		Where necessary in cut areas.
Material delivery and storage	X	X	X	X	X	X		X	X	Designated staging area(s)
Material use during building process		X	X	X	X	X		X	X	Building construction area(s)
Solid waste (trash and debris)								X	X	Designated trash receptacle(s)
Hazardous waste			X	X	X	X			X	Designated staging area(s) and building construction area(s)
Contaminated spills		X	X	X	X	X			X	Designated staging areas and building construction area(s)
Sanitary/septic waste		X		X			X		X	Designated port-a-potty area(s)
Vehicle/equipment use and storage						X			X	Designated vehicle storage and refuel area(s)
Landscaping operations	X	X						X		Landscaping area(s)



**3.10 ENDANGERED SPECIES CERTIFICATION**

Is there evidence of endangered/threatened species or critical habitats on or near the project area?

Yes             No

Describe how this determination was made:

The project disturbance limits only include existing building and parking lot. Therefore, are no species or habitat area being disturbed in the demolition limits of this project.

**3.11 HISTORIC PRESERVATION**

Are there any historic sites on or near the construction site?

Yes             No             Not Applicable

**3.12 APPLICABLE FEDERAL, TRIBAL, STATE OR LOCAL PROGRAMS**

State of Missouri Clean Water Law requirements administered through the Missouri Department of Natural Resources (MDNR) apply. No tribal programs apply. Permits for the state and local land disturbance programs are included in Appendix A.

**3.13 MAPS**

All site maps for this SWPPP shall be the following civil construction plan sheets prepared for this project:

Sheet #	Plan Title	Plan Date
C0.01	Cover Sheet	Latest sealed date by Civil Engineer and approved by authority having jurisdiction.
C0.02	General Notes	
V1.01-V1.07	Topographic Survey	
C1.01	Phase 1 Demolition Plan	
C1.02 – C1.07	Phase 2 Demolition Plan	
C2.01 – C2.05	Site Plan	
C3.01	Erosion Control Plan	
C4.01	Phase 1 Grading Plan	
C4.02	Phase 2 Grading Plan	
C5.01 – C5.02	Temporary Traffic Control Plan	
C6.01	Site & Erosion Control Details	
C7.01	Water Details	
C8.01	Temporary Traffic Control Details	

The Contractor shall make copies of the site maps, fold them, and put them in the onsite SWPPP for documentation. The Contractor shall then track progress and document maintenance or amendments to the SWPPP via dating and redlining these site maps. If a redlined plan becomes too full to be easily legible and understood, simply date and fold it, put it in the onsite SWPPP for documentation, and start a new one. That way, there is a good hard copy record of what has occurred onsite.

Site maps should show the construction activities and stormwater management practices for each major phase of construction (initial grading, infrastructure, construction, and stabilization). Site maps should identify the following features:

- Stormwater flow and discharges
- Areas and features to be protected
- Disturbed areas (locations and timing of activities)
- Clearing limits
- Identify locations of structural and non-structural BMPs
- Identify locations of Post-construction BMPs
- Areas of stabilization
- Indicate locations of material, waste, borrow, or equipment storage

The site maps should show changes that have been made to the construction site, and BMPs and stabilization methods as the site progresses. The SWPPP shall be kept up to date, so redline the site maps with the locations and dates of any changes being made. Also include the current locations of the following:

- Portable toilets
- Material storage, vehicle and equipment fueling and maintenance areas
- Concrete, paint and stucco washouts
- Dumpster containers
- Spill kits
- Stockpiles
- All other BMPs and whatever changes have been done to them
- Environmentally sensitive areas
- Stream buffers
- SWPPP amendments

## **SECTION 4: EROSION AND SEDIMENT CONTROL BMPS**

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### **4.1 GENERAL**

The BMPs shall be constructed or applied in accordance with this SWPPP, maps or construction plans, and all State or local requirements. Good engineering practices shall be used if there is a lack of information or changes are proposed for a BMP. The Contractor shall install the BMPs in the order indicated in the construction plans. BMPs shall be applied within the timeframe specified in the permit.

The Contractor shall be responsible for implementing all aspects of the SWPPP, including all BMPs. The Contractor may designate these tasks to certain subcontractors as they see fit, but the ultimate responsibility for implementing these BMPs and ensuring their proper functioning remains with the Contractor. An Implementation Schedule can be found in Appendix G.

To ensure that controls are adequately implemented, it is important that the work crews who install the BMPs are experienced or adequately trained. Improperly installed BMPs have little or no effect and may adversely affect the pollution of stormwater. It is important that all workers on the construction site are aware of the BMPs so they do not inadvertently disturb or remove them.

Additional information for BMPs are available in the latest version of: "Protecting Water Quality: a field guide to erosion, sediment and stormwater best management practices for development sites in Missouri and Kansas", available on the MDNR website.

**4.2 MINIMIZE DISTURBED AREA AND PROTECT NATURAL FEATURES AND SOIL**

<b>BMP:</b>	<b>Existing Vegetation Preservation (can include: tree/climax forest, native uplands, native bottomland/floodplain preservation, etc.)</b>
Responsible Staff:	
Location:	Where indicated in the civil plans.
Installation Schedule:	Before construction begins on the site. See Sequence of Events on the Cover Sheet of civil plans.
<b>Description:</b>	
All equipment, grading, trenching, material storage, trash, sediment laden runoff, and disturbance of any kind shall be kept away from preservation areas. To provide a clear indication of where these areas are, a temporary chord fence with orange streamers as detailed in the civil plans shall be installed. Climax forest fence shall be installed at the drip line of the tree(s)/tree line, which is the outermost reach of the branches.	
<b>Maintenance &amp; Inspection:</b>	
All preservation areas shall be inspected during routine SWPPP inspections to ensure there is no disturbance of any kind, all temporary fences are intact and still provide a clear indication of where the onsite preservation areas are, and there is no trash or hazardous materials. Disturbance and fence damage shall be repaired immediately. Reasons for the disturbance shall be investigated and coordination done with responsible parties to ensure it does not happen again. All trash shall be removed immediately. The trees/vegetation within the preservation area shall be inspected to ensure there are no area wide signs of stress/disease, etc. Any damage to limbs/roots shall be repaired by making a clean cut using the stub-cut method. Area wide signs of stress or disease shall be reported to the Operator. Inspect for signs of sediment disposition, active erosion, and/or unstable areas that are eroding. Eliminate the sediment disposition and erosion by directing runoff from the disturbed project area away from the preservation area or reinforce the eroded area by placement of riprap or rock check dams using methods that will require no removal of existing vegetation and minimal disturbance. Extensive erosion shall be reported to the Operator.	
Removal Requirements:	Remove all fencing only after all construction is complete and all disturbed soil is stabilized.

<b>BMP:</b>	<b>Topsoiling: Removal, Stockpiling, and Replacement</b>
Responsible Staff:	
Location:	Within project grading areas only.
Installation Schedule:	After all perimeter erosion and sediment controls are in place and after clearing and grubbing is completed.
<b>Description:</b>	
Topsoil shall meet the definition provided in the specifications. If specifications are not provided it shall be defined as the top layer of the soil profile usually richest in organic matter and nutrients consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects larger than 2 inches (50 mm) in diameter; and free of weeds, roots, toxic materials, or other nonsoil materials. A pH range of 5.0-7.5 is acceptable. Topsoil will be stripped to a minimum depth of 4" or as indicated in the geotechnical report or specifications for the project. Depths of removal may also vary as encountered in the field and directed by the geotechnical engineer. The topsoil will be stockpiled where indicated in the civil construction plans. The stockpile(s) will be in areas that will not interfere with construction phases and at least 15 feet away from concentrated flows. A silt fence shall immediately be installed around the perimeter of each stockpile, in accordance with silt fence design specifications per this SWPPP. If stockpiles are to remain for longer than 14 days, they shall be temporarily	

seeded as indicated in this SWPPP. Stockpiles that will remain longer than 6 months shall be permanently seeded as indicated in this SWPPP. All rough grading operations within landscape areas shall be completed 4” below finish grade to allow the placement of 4” of topsoil (or depth per specifications). To provide an optimum growing medium and allow for rainfall infiltration, the topsoil shall be placed in one lift with light compaction not to exceed 85-90% maximum dry density according to ASTM D698. Do not drive over any areas of topsoil placement to avoid further compaction.

**Maintenance & Inspection:**

All areas shall be inspected during routine SWPPP inspections to ensure the stockpiles and surrounding silt fence(s) are stable and functioning as intended. Inspect the silt fence(s) per the silt fence BMP description in this SWPPP. If required, inspect vegetation establishment on stockpile and correct as necessary. Inspect topsoil that has been spread for erosion, over compaction, and poor vegetation establishment. Correct over compacted areas by tilling 4” deep and smoothing and reseeded or sodding. Determine cause of erosion and correct as necessary immediately. Fertilize, reseed and mulch, (or resod if required) and water all areas of poor vegetation establishment.

Removal Requirements:	At the completion of the project, remove all silt fence from stockpiles. Remove all stockpiles by spreading leftover topsoil onsite in areas directed by Operator. Seed, mulch, and water all disturbed areas.
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**4.3 PHASE CONSTRUCTION ACTIVITY**

<b>BMP:</b>	<b>Phased Grading</b>
Responsible Staff:	
Location:	Project grading limits.
Installation Schedule:	Per the Sequence of Events on the civil construction plans Cover Sheet.
<b>Description:</b>	
Because of the relatively small project area, it is not practical to perform phased grading at this site. To minimize potential erosion, only areas necessary to construct the construction exit(s), perimeter sediment control, and the shall be disturbed initially. These areas shall be cleared, grubbed, and graded and the construction exit(s) shall be installed. Further clearing, grubbing, and grading shall then proceed only within areas where immediate earthwork is needed. Erosion and sediment controls shall be implemented immediately after construction allows but no later than 14 days after construction ceases.	
<b>Maintenance &amp; Inspection:</b>	
Responsible staff shall be constantly aware of the construction schedule and make whatever adjustments may be necessary to minimize the amount of disturbed area at any one time. Inspections shall be made weekly to ensure all graded areas are property stabilized immediately after completion of construction or if there will be a break in land disturbance activities longer than 14 days.	

**4.4 TEMPORARY STRUCTURAL BMPs**

<b>BMP:</b>	<b>Silt Fence</b>
Responsible Staff:	
Location:	Where indicated on the civil construction plans & as necessary.
Installation Schedule:	Per the Sequence of Events on the civil construction plans Cover Sheet.
<b>Description:</b>	
Silt fence consists of a geotextile fabric that is attached to supporting posts and trenched into the ground. This is	

<p>applied where sheet erosion (not channelized) occurs over small areas. It is typically installed at the same elevation following the contour of the land. Its purpose is to filter sediment laden runoff on the uphill side. Install as detailed in the civil construction plans.</p>	
<p><b>Maintenance &amp; Inspection:</b></p>	
<p>All silt fence shall be inspected during routine SWPPP inspections for proper functioning, stability, and general condition. Verify the fence posts are still structurally sound, the fabric is still securely attached to the fence posts, and the fabric is still trenched into the ground with no runoff occurring under the fence. Remove built up sediment when it has reached 1/3 the height of the fence. Take care to avoid undermining the fence during sediment removal. All repairs/maintenance shall be done immediately.</p>	
<p>Removal Requirements:</p>	<p>Remove when the disturbed area draining to the BMP is stabilized. The area is considered stabilized when perennial vegetation or permanent materials (buildings, pavement, etc) cover all areas that have been disturbed. Vegetative cover shall be at least 70% of fully established density over the entire disturbed area that is to be vegetated. Areas disturbed during the removal of the BMP shall be smooth graded and permanently seeded and mulched.</p>

<b>BMP:</b>	<b>Silt Fence Inlet Protection</b>
Responsible Staff:	
Location:	Where indicated on the civil construction plans.
Installation Schedule:	Immediately after construction of each storm sewer inlet.
<p><b>Description:</b></p>	
<p>Silt fence inlet protection is reinforced silt fence installed completely around a stormwater inlet to filter and pond sediment laden runoff to allow drop out of the sediment before it drains into the inlet. Install as detailed in the civil construction plans.</p>	
<p><b>Maintenance &amp; Inspection:</b></p>	
<p>All inlet protection shall be inspected during routine SWPPP inspections for proper functioning, stability, and general condition. Verify the fabric and wire support is still in good condition with no rips, holes, or signs of stretching or stress. Verify the posts and supports are still structurally sound, the fabric is still securely attached to the posts and supports, and the fabric is still trenched into the ground with no runoff occurring under the fence. Remove built up sediment when it has reached 1/3 the height of the fence. All sediment removed shall be placed onsite as fill in non structural areas or as directed by the Operator. All repairs/maintenance shall be done immediately.</p>	
<p>Removal Requirements:</p>	<p>Remove when the disturbed area draining to the BMP is stabilized. The area is considered stabilized when perennial vegetation or permanent materials (buildings, pavement, etc) cover all areas that have been disturbed. Vegetative cover shall be at least 70% of fully established density over the entire disturbed area that is to be vegetated. Areas disturbed during removal of the BMP shall be smooth graded and permanently seeded and mulched.</p>

<b>BMP:</b>	<b>Curb Inlet Filters</b>
Responsible Staff:	
Location:	All existing downstream curb inlets; all new curb inlets; where indicated on the civil construction plans.
Installation Schedule:	Prior to construction at all nearby existing curb inlets downstream from any disturbed area. Immediately after paving around each new curb inlet.
<p><b>Description:</b></p>	
<p>Curb Inlet filters are manufactured filters temporarily placed over/around/in front of the grate and/or curb intake</p>	

of curb inlet storm sewer structures and are designed to let stormwater flow through the fibrous material while stopping sediment, debris, and trash. Common systems include Sediment logs, Gutterbuddy, Silt-Savers, and InletSoxx. Install per the manufacturer's written instructions. The filter should overlap both sides of the inlet opening by a minimum 12 inches.	
<b>Maintenance &amp; Inspection:</b>	
All filters shall be inspected during routine SWPPP inspections for proper functioning, clogging, sediment build up, structural integrity, and as recommended by the manufacturer. Clean the filters and remove all trash, debris, fluids, and sediment from all units every month minimum, or as recommended by the manufacturer. Trash/debris removed from unit(s) shall be disposed of offsite as legally allowed. Sediment shall be disposed of onsite in non-structural fill areas. All repairs/maintenance shall be done immediately. Complete replacement of the filter may be required if it is clogged.	
<b>Removal Requirements:</b>	Remove when the disturbed area draining to the BMP is stabilized. The area is considered stabilized when perennial vegetation or permanent materials (buildings, pavement, etc) cover all areas that have been disturbed. Vegetative cover shall be at least 70% of fully established density over the entire disturbed area that is to be vegetated. Areas disturbed during removal of the BMP shall be smooth graded and permanently seeded and mulched.

**4.5 PERMANENT NON-STRUCTURAL BMPs**

<b>BMP:</b>	<b>Permanent Seeding</b>			
Responsible Staff:				
Location:	All disturbed areas except sodded areas, surfaced areas, solid rock, or areas consisting of primarily broken rock.			
Installation Schedule:	Per the Sequence of Events on the civil construction plans Cover Sheet and/or as necessary.			
<b>Description:</b>				
Permanent seeding is the establishment of perennial vegetation for graded areas that will be undisturbed for longer than 6 months. Permanent seeding and planting shall be performed within 14 days after final grade is reached or within 7 days after final grade is reached if the slope of the area is greater than 3:1 (3 feet horizontal to 1 foot vertical) or if the slope is greater than 3% and greater than 150 feet in length, unless temporary stabilization is applied. Permanent seeding shall be completed per the project specifications or landscape plan. If no specification/plan is provided, the following methods can be applied:				
<i>Seedbed Preparation:</i>				
For broadcast seeding and drilling, loosen the soil via tilling to a depth of 3 inches. For no-till drilling, the soil does not need to be loosened unless the site has surface compaction. If compacted, till 3 inches deep.				
<i>Soil Amendments:</i>				
Obtain a minimum of three soil tests from various areas on the site and add fertilizer and lime according to the test results. If soil tests are not available, spread lime evenly at a rate of 92 pounds per 1,000 square feet of area. Spread evenly a 5.5-16-16 fertilizer at a rate of 7 pounds per 1,000 square feet of area. Mix the soil amendments into the top 3 inches of soil.				
<i>Seed:</i>				
Plant seed ¼ to ½ inch deep or rake in after application. Apply mulch and water immediately after seed application. Water to a depth of 2 inches without causing erosion. Grass seed mixture recommended for use in lawn areas:				
Type	% Mix by Weight	Minimum Purity	Minimum Germination	Seeding Rate (lb/acre)
Tall or Turf Fescue (minimum 3 cultivars)	80	98%	90%	150 minimum or as recommended by manufacturer

Annual Rye	20	98%	90%	25 minimum
The percent mixture by weight is for pure live seed (PLS). Weed seed shall not exceed 1.0% by weight of the mix. A seed mix certification shall be approved by the Operator prior to seeding.				
<i>Mulch:</i>				
All mulch shall consist of clean, bright, plant residues and be free of weed seeds, mold, and rot. No more than 15% of the ground surface shall be visible after mulching. Install per manufacturer's recommendations. Straw mulch shall be applied at a minimum rate of 3,000 lbs/acre.				
<i>Planting Dates:</i>				
Apply permanent seed and mulch only between the dates of February 1 thru May 15 and August 15 thru October 15 <sup>th</sup> . Seeding and mulching outside these dates shall be done according to temporary seeding requirements with reseeded at 50% the permanent seeding rates done during the next allowable permanent seeding planting dates.				
<b>Maintenance &amp; Inspection:</b>				
All seeded areas shall be inspected during routine SWPPP inspections for erosion, germination, vigorous seedlings, uniform density with at least 70% ground cover, disease, drought stress, and seed wash out. Water 1 inch deep every 7 day stretch with less than ½ inch total rain accumulation until grass is 3 inches tall. Do not mow until grass is 4 inches tall, and then mow at a 3 inch height, minimum. All repairs/maintenance shall be done immediately.				

<b>BMP:</b>	<b>Sodding</b>
Responsible Staff:	
Location:	Where indicated on the civil construction plans or landscape plans.
Installation Schedule:	Per the Sequence of Events on the civil construction plans Cover Sheet.
<b>Description:</b>	
Sodding is the laying of vegetative cover that includes both grass plants and their established root system. Sodding shall be completed per the project specifications or landscape plan. If no specification/plan is provided, the following methods can be applied:	
<i>Soil Preparation:</i>	
Loosen the soil if the site has surface compaction. If compacted, till 3 inches deep.	
<i>Soil Amendments:</i>	
Per the sod manufacturer. If the manufacturer provides no written soil amendment requirements, obtain a minimum of three soil tests from various areas on the site and add fertilizer and lime according to the test results. If soil tests are not available, spread lime evenly at a rate of 92 pounds per 1,000 square feet of area. Spread evenly a 5.5-16-16 fertilizer at a rate of 7 pounds per 1,000 square feet of area. Mix the soil amendments into the top 3 inches of soil.	
<i>Sod:</i>	
Sod shall consist of, or a mixture of: turf/tall fescue, Bermuda, Zoysia, or Buffalograss cultivars suitable for the site's climate. Install in staggered rows with offset joints. Lay rows perpendicular to the slope. Tamp or roll all sod immediately after installation to provide root contact with the soil. Water thoroughly to a depth of 2 inches upon installation.	
<i>Sodding Dates:</i>	
Sodding can be done at any time of the year except when the ground is frozen or there is a ground cover such as snow or ice.	
<b>Maintenance &amp; Inspection:</b>	
All sodded areas shall be inspected during routine SWPPP inspections for erosion, vigorous growth, uniform density with at least 95% ground cover, disease, and drought stress. Water as necessary to prevent drying out. During summer months this can be every day. Do not mow until grass is 4 inches tall, and then mow at a 3 inch height, minimum. All repairs/maintenance shall be done immediately.	

**4.6 TEMPORARY NON-STRUCTURAL BMPs**

<b>BMP:</b>	<b>Construction Entrance/Exit</b>
Responsible Staff:	
Location:	Where indicated on the civil construction plans.
Installation Schedule:	Per the Sequence of Events on the civil construction plans Cover Sheet.
<b>Description:</b>	
A temporary rock construction exit is a stone base pad installed to provide an exit area where vehicles can drop the mud and caked soil from their tires to avoid transporting it onto public roads. The mud and dirt that ends up on the street is called “track out” and is the #1 complaint of construction sites. A larger stone should comprise the surface of the exit to vibrate/jar the truck and flex the rubber to encourage mud and soil to drop off. Provide water via a water truck and wash all tires and wheel wells of all vehicles prior to leaving the site. Direct all runoff into a sediment trap set up on the downstream side of the exit pad. Install as detailed in the civil construction plans.	
<b>Maintenance &amp; Inspection:</b>	
All construction exits shall be inspected during routine SWPPP inspections for proper functioning, stability, and general condition. Shovel or wash off the rock surface often to prevent soil build up and clogging of the stone. This may need to be several times a day. If surface becomes smooth or clogged, top-dress with clean 2-3 inch stone immediately. Remove sediment from the sediment trap when it has reached ½ the design depth. All sediment removed shall be placed onsite as fill in non structural areas or as directed by the Operator. All repairs/maintenance shall be done immediately.	
Removal Requirements:	Remove when all disturbed areas are stabilized or all construction vehicles have been permanently demobilized. The area is considered stabilized when perennial vegetation or permanent materials (buildings, pavement, etc) cover all areas that have been disturbed. Vegetative cover shall be at least 70% of fully established density over the entire disturbed area that is to be vegetated. Areas disturbed during removal of the BMP shall be smooth graded and permanently seeded and mulched.

<b>BMP:</b>	<b>Pavement/Curb &amp; Gutter Sweeping</b>
Responsible Staff:	
Location:	Where necessary.
<b>Description:</b>	
Pavement/curb & gutter sweeping involves picking up and removing all trash, debris, and sediment from onsite land disturbance activities that has accumulated on all public and private paved surfaces near the project site. This can be done by hand via broom, or via mechanical street sweeping and vacuum machines. The sediment shall be picked up and disposed of as onsite fill, it shall not be washed off the pavement into storm sewers or other drainage ways via pressure washing or water trucks.	
<b>Maintenance &amp; Inspection:</b>	
All onsite and nearby offsite paved surfaces shall be inspected during routine SWPPP inspections for trash, debris, and sediment deposition on the surface. All sediment shall be removed immediately. The cause of the trash, debris, and/or sediment deposition shall be identified and immediately corrected.	



<b>BMP:</b>	<b>Temporary Seeding</b>	
Responsible Staff:		
Location:	Where indicated on the civil construction plans and/or where necessary during the construction process.	
Installation Schedule:	As required or necessary.	
<b>Description:</b>		
<p>Temporary seeding is the establishment of fast-growing annual vegetation on disturbed areas to provide erosion control for up to 6 months. This BMP applies where short-lived vegetation needs to be established before final grading or in a season not suitable for permanent seeding. If an area is expected to be undisturbed for longer than 6 months, permanent perennial vegetation shall be used. Temporary seeding and planting shall be performed within 14 days after grading operations cease or within 7 days after final grade is reached if the slope of the area is greater than 3:1 (3 feet horizontal to 1 foot vertical) or if the slope is greater than 3% and greater than 150 feet in length. Temporary seeding shall be completed per the project specifications or landscape plan. If no specification/plan is provided, the following methods can be applied:</p>		
<i>Seedbed Preparation:</i>		
Loosen the soil via tilling to a depth of 3 inches.		
<i>Soil Amendments:</i>		
Obtain a minimum of three soil tests from various areas on the site and add fertilizer and lime according to the test results. If soil tests are not available, spread lime evenly at a rate of 69 pounds per 1,000 square feet of area. Spread evenly a 5.5-16-16 fertilizer at a rate of 6 pounds per 1,000 square feet of area. Mix the soil amendments into the top 3 inches of soil.		
<i>Seed:</i>		
Plant small grains no more than 1 ½ inches deep. Plant grasses and legumes ¼ to ½ inch deep or rake in after application. Apply mulch and water immediately after seed application. Water to a depth of 2 inches without causing erosion. Seed mixture can be any combination of the following:		
Species	Seeding Rate	
	lbs. per Acre	lbs./1,000 square feet
Oats	80	2
Cereals: Rye/Wheat	90-120	2-2.5
Millets, Sudangrass	45-60	1-1.25
Annual Ryegrass	75	2
Annual Lespedeza plus Tall Fescue	15 plus 45	0.5 plus 1
<i>Mulch:</i>		
All mulch shall consist of clean, bright, plant residues and be free of weed seeds, mold, and rot. No more than 15% of the ground surface shall be visible after mulching. Install per manufacturer's recommendations. Straw mulch shall be applied at a minimum rate of 3,000 lbs/acre.		
<i>Planting Dates:</i>		
Apply temporary seed and mulch any time of the year, but do not apply on frozen, ice or snow covered ground.		
<b>Maintenance &amp; Inspection:</b>		
All seeded areas shall be inspected during routine SWPPP inspections for erosion, germination, vigorous seedlings, uniform density with at least 70% ground cover, disease, drought stress, and seed wash out. Reseed and mulch as necessary. Water when dry. Do not mow or only mow after 6 inches tall and then mow at a 4 inch height, minimum. All repairs/maintenance shall be done immediately.		
Removal Requirements:	Remove when the area is ready to be disturbed again.	

<b>BMP:</b>	<b>Tackifiers and Binders</b>
Responsible Staff:	
Location:	Where indicated on the civil construction plans.
Installation Schedule:	Immediately after final grades are achieved.
<b>Description:</b>	
Tackifiers and Binders are substances used to anchor straw, hay, wood, or paper mulch by causing organic material to bind together. The binding and anchoring of the mulch minimizes or prevents movement of the mulching material from the desired location during rain or watering events. They are typically applied via hydroseeding or hydromulching techniques.	
<b>Maintenance &amp; Inspection:</b>	
All tackifiers and binder application shall be inspected during routine SWPPP inspections for proper functioning, stability, and general condition. Inspect to verify it is functioning as intended. Inspect and repair as necessary to ensure intended function. All repairs/modifications shall be made immediately.	
Removal Requirements:	None.

<b>BMP:</b>	<b>Dust Control &amp; Air Emissions</b>
Responsible Staff:	
Location:	Where necessary based on current site conditions.
Installation Schedule:	Immediately when current site conditions warrant.
<b>Description:</b>	
Open burning will only be allowed per state and local regulations. Contractor is responsible for obtaining all necessary burning permits. In Missouri, state regulation places a limit on the amount of visible dust that can leave a property boundary. For more information research state regulation 10 CSR 10-6.170. Minimize wind erosion and control dust via the following methods: <ul style="list-style-type: none"> <li>1. Cover 30% or more of disturbed surface with non-erodible material.</li> <li>2. Roughening the disturbed areas to produce ridges perpendicular to the prevailing wind. Ridges should be about six (6) inches in height.</li> <li>3. Frequent watering of disturbed areas.</li> </ul>	
<b>Maintenance &amp; Inspection:</b>	
All dust control shall be inspected during routine SWPPP inspections for proper functioning, stability, and general condition. Verify onsite dust creation is below state and local requirements.	

**4.7 ADDITIONAL BMPS**

<b>BMP:</b>	<b>Management of Excavation Spoil Materials</b>
Responsible Staff:	
Location:	Where indicated in the construction plans.
Installation Schedule:	
Description:	
Excavation spoil materials result from localized grading that occurs post mass grading for footings, docks/truckwells, utility trenches, geowells, etc. These materials must be properly managed to prevent them from contributing to storm water discharges. The materials generated from the development of this project shall be managed by the following method: hauled off-site. If they must be temporarily stockpiled, they shall be placed where all storm water runoff will drain to a BMP and temporarily seeded and mulched immediately after construction.	
Maintenance & Inspection:	
All excavation spoil materials shall be inspected during routine SWPPP inspections for proper functioning, stability, erosion, and general condition. Verify all stockpiles drain to properly functioning BMPs and no untreated storm water runoff is occurring. All repairs/maintenance shall be done immediately.	

<b>BMP:</b>	<b>Dewatering (if necessary)</b>
Responsible Staff:	
Location:	
Installation Schedule:	
Description:	
Dewatering operations from footing/trench/etc. excavations shall not be discharged offsite without treatment. Turbid dewatering discharge shall be directed to another BMP to allow filtering or settling prior to discharging offsite. <i>(below to be filled in by Contractor)</i>	
Dewatering Methods:	
Dewatering Maximum Flow:	GPM
BMP(s) Dewatering Will be Directed To:	
Maintenance & Inspection:	
All dewatering operations shall be inspected during routine SWPPP inspections for proper functioning, stability, erosion, and general condition. Verify all dewatering discharge drains to properly functioning BMP(s) and no untreated storm water runoff is occurring. Verify the BMP(s) are properly handling the amount of dewatering discharge they are receiving. All repairs/maintenance shall be done immediately.	

## SECTION 5: GOOD HOUSEKEEPING BMPS

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### 5.1 MATERIAL HANDLING AND WASTE MANAGEMENT

Substances regulated by federal law under the Resource Conservation and Recovery Act (RCRA) or the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) which are transported, stored or used for maintenance, cleaning or repairs shall be managed according to the provisions of RCRA and CERCLA.

The following materials or substances with known hazardous properties are expected to be present onsite during construction:

Concrete/Additives/Wastes	Cleaning solvents
Detergents	Petroleum based products
Paints/Solvents	Pesticides
Acids	Fertilizers
Solids and construction wastes	Sanitary wastes
Soil stabilization additives	

All paints, solvents, petroleum products and petroleum waste products (except fuels) and storage containers (such as drums, cans or cartons) shall be stored such that these materials are not exposed to storm water. Sufficient practices of spill prevention, control and/or management shall be provided to prevent any spills of these pollutants from entering a water of the state. Any containment system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall also prevent the contamination of groundwater. The following are the material management practices that shall be used to reduce the risk of spills or other accidental exposure of materials and substances to stormwater runoff. The jobsite superintendent shall be responsible for ensuring that these procedures are followed.

a) Good Housekeeping

The following good housekeeping practices shall be followed onsite during the construction project.

- (i) An effort shall be made to store only enough products required to do the job.
- (ii) All materials stored onsite shall be stored in a neat, orderly manner and, if possible, under a roof or in a containment area. At a minimum, all containers shall be stored with their lids on when not in use. Drip pans shall be provided under all dispensers.
- (iii) Products shall be kept in their original containers with the original manufacturer's label in legible condition.
- (iv) Substances shall not be mixed with one another unless recommended by the manufacturer.
- (v) Whenever possible, all of a product shall be used up before disposing of the container.
- (vi) Manufacturer's recommendations for proper use and disposal shall be followed.
- (vii) The job site superintendent shall be responsible for daily inspections to ensure proper use and disposal of materials.
- (viii) Fertilizers shall be applied in the minimum amounts recommended by the manufacturer.
- (ix) All paint containers shall be tightly sealed and stored when not required for use. Excess paint shall not be dumped into the storm sewer system but shall be properly disposed of according to manufacturer's instructions and State regulations.

b) Hazardous Products

These practices shall be used to reduce the risks associated with hazardous materials. Material Safety Data Sheets (MSDS's) for each substance with hazardous properties that is used on the job site shall be obtained and used for the proper management of potential wastes that may result from these products. An MSDS shall be posted in the immediate area where such product is stored and/or used and another copy of each

MSDS shall be maintained in the SWPPP file at the job site construction trailer office. Each employee who must handle a substance with hazardous properties shall be instructed on the use of MSDS sheets and the specific information in the applicable MSDS for the product he/she is using, particularly regarding spill control techniques.

- (i) Products shall be kept in original containers with the original labels in legible condition.
- (ii) Original labels and material safety data sheets (MSDS's) shall be procured and used for each material.
- (iii) If surplus product must be disposed of, manufacturer's or local/state/federal recommended methods for proper disposal shall be followed.

c) Hazardous Waste

All hazardous waste materials shall be disposed of by the Contractor in the manner specified by local, state, and/or federal regulations and by the manufacturer of such products. Site personnel shall be instructed in these practices by the job superintendent, who shall be responsible for seeing that these practices are followed.

d) Product Specific Practices

The following product specific practices shall be followed on the job site.

(i) Petroleum Products

All onsite vehicles shall be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products shall be stored in tightly sealed containers that are clearly labeled. Any petroleum storage tanks used onsite shall have an impervious dike or berm containment structure constructed around it to contain any spills which may occur. Drip pans shall be provided for all dispensers. Any asphalt substances used onsite shall be applied according to the manufacturer's recommendations. The location of any fuel tanks and/or equipment storage areas shall be identified on the SWPPP maps by the Contractor once the locations have been determined.

(ii) Fertilizers

Fertilizers shall be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer shall be worked in the soil to limit exposure to stormwater. Storage shall be in a covered shed. The contents of any partially used bags of fertilizer shall be transferred to a sealable plastic bin to avoid spills.

(iii) Paints, Paint Solvents, and Cleaning Solvents

All containers shall be tightly sealed and stored when not in use. Excess paint and solvents shall not be discharged to the storm sewer system but shall be properly disposed of according to manufacturer's instructions or state and federal regulations.

<b>BMP:</b>	<b>Construction Waste Materials Containment</b>
Responsible Staff:	
Location:	
Installation Schedule:	
<b>Description:</b>	
<p>All non hazardous waste materials shall be collected and stored in an appropriately covered container and/or securely lidded metal dumpster rented from a local waste management company which must be a solid waste management company licensed to do business in the project area. The dumpster shall comply with all local and state solid waste management regulations.</p> <p>All trash and construction debris from the site shall be deposited in the dumpster. The dumpster shall be emptied a minimum of twice per week or more often if necessary, and the trash shall be hauled to a landfill approved by the state for legal disposal offsite. No construction waste or trash materials of any kind shall be buried on site. All personnel shall be instructed regarding the correct procedures for waste disposal.</p> <p>All waste dumpsters and roll-off containers shall be located in an area where the likelihood of the containers contributing to storm water discharges is negligible. If required, additional BMPs shall be implemented, such as sandbags around the base, to prevent wastes from contributing to storm water discharges. The location of waste dumpsters and roll-off containers shall be identified on the SWPPP maps by the Contractor once the locations have been determined.</p>	
<b>Maintenance &amp; Inspection:</b>	
<p>All dumpsters and/or other waste storage areas shall be inspected during routine SWPPP inspections for proper functioning, stability, and general condition. Dumpsters shall be emptied before trash accumulation prevents complete closure of the lid(s). If trash and construction debris are exceeding the dumpster capacity more dumpsters shall be provided or they shall be emptied more often.</p>	
Removal Requirements:	Remove when all waste contributing construction is complete.

<b>BMP:</b>	<b>Sanitary Facilities</b>
Responsible Staff:	
Location:	
Installation Schedule:	
<b>Description:</b>	
<p>Temporary sanitary facilities (portable toilets) shall be provided by a licensed portable facility provider in complete compliance with local and state regulation. Facilities shall be sized to accommodate the maximum anticipated work force on any given day. Facilities shall be property anchored to prevent tip over or other uncontrolled movement.</p> <p>All sanitary facilities shall be located in an area where the likelihood of the unit contributing to storm water discharges is negligible. The location of sanitary facilities shall be identified on the SWPPP maps by the Contractor once the locations have been determined.</p>	
<b>Maintenance &amp; Inspection:</b>	
<p>All sanitary facilities shall be inspected during routine SWPPP inspections for proper functioning, stability, and general condition. Sanitary facilities shall be regularly emptied, serviced and repaired. Sanitary waste shall be disposed per all applicable state and local requirements.</p>	
Removal Requirements:	Remove when construction is complete and all construction staff has left the site or when other onsite sanitary facilities are available and permission for their use by construction staff is approved by the Operator.

<b>BMP:</b>	<b>Hazardous Waste Containment</b>
Responsible Staff:	
Location:	
Installation Schedule:	
<b>Description:</b>	
All hazardous waste materials such as oil filters, petroleum products, paint, and equipment maintenance fluids shall be stored in structurally sound and sealed containers in a designated hazardous materials storage area and segregated from other non-waste materials. Additionally, all hazardous material will be disposed of in accordance with federal, state, and local regulations. Hazardous waste materials shall not be disposed of into on-site dumpsters.	
<b>Maintenance &amp; Inspection:</b>	
All hazardous storage areas shall be inspected during routine SWPPP inspections for proper functioning, stability, and general condition. The storage areas shall be kept clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Material safety data sheets, material inventory, and emergency contact numbers shall be maintained in the office trailer or other clearly designated area.	
Removal Requirements:	Remove when all hazardous waste contributing construction is complete.

**5.2 ESTABLISH PROPER BUILDING MATERIAL STAGING AREAS**

<b>BMP:</b>	<b>Staging Area</b>
Responsible Staff:	
Location:	
Installation Schedule:	
<b>Description:</b>	
Construction equipment and materials shall be stored at a designed staging area. The staging area is typically located in a proposed parking area and shall consist of an all-weather granular surface that will also be the granular base for the parking lot pavement. The location of all staging areas shall be redlined on the SWPPP maps. Storm water shall be directed away from the staging area.	
<b>Maintenance &amp; Inspection:</b>	
All staging areas shall be inspected during routine SWPPP inspections for proper functioning, stability, and general condition. The staging area(s) shall be kept clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners shall be repaired or replaced as needed to maintain proper function. The granular surface shall be kept clean and inspected for signs of settlement or rutting. All repairs shall be made immediately.	
Removal Requirements:	Remove when all construction materials have been removed and the storage of construction equipment is no longer necessary.

**5.3 ESTABLISH PROPER EQUIPMENT/VEHICLE FUELING AND MAINTENANCE PRACTICES**

<b>BMP:</b>	<b>Vehicle/Equipment Fueling and Maintenance</b>
Responsible Staff:	
Location:	
Installation Schedule:	
Description:	
Only minor equipment maintenance shall occur onsite. All major equipment/vehicle maintenance shall be performed off-site. Vehicle/equipment maintenance and fueling area(s) shall be clearly marked and be kept clean and dry. A spill kit shall be kept nearby. Drip pans, drip clothes, or absorbent pads shall be used when replacing spent fluids. Spent fluids shall be collected and stored in appropriate labeled containers in the proper storage areas. Recycle fluids whenever possible. Dispose of fuels, oils, lubricants, solvents, and other hazardous materials offsite per federal, state and local requirements. Petroleum products shall be stored in tightly sealed containers which are clearly labeled. No fueling, servicing, maintenance, or repair of equipment or machinery shall be done within 50 feet of a stormwater drainage way, or within 100 feet of a classified stream, lake/pond, losing stream, or sinkhole.	
Maintenance & Inspection:	
All equipment/vehicle fueling and maintenance facilities shall be inspected during routine SWPPP inspections for proper functioning, usage, and general condition. Vehicles and equipment shall be inspected on each day of use. Leaks shall be repaired immediately. Any problem vehicle(s) or equipment shall be removed from the project site. Inspect to verify there is an ample supply of spill-cleanup materials onsite.	
Removal Requirements:	Remove when the need for construction vehicles onsite is no longer necessary.

**5.4 CONTROL EQUIPMENT/VEHICLE WASHING**

All equipment/vehicle washing not related to dirt/mud removal at the construction entrance/exit BMP shall be done offsite.

**5.5 SPILL PREVENTION AND CONTROL PLAN**

<b>BMP:</b>	<b>Spill Prevention and Response Procedures</b>
Responsible Staff:	
Spill Prevention & Response Coordinator:	
Installation Schedule:	Training will begin prior to the start of project construction. All other procedures shall begin with the start of project construction.
Description:	
All onsite personnel shall be trained in the spill prevention, proper handling, and cleanup procedures of spilled materials. No spilled hazardous materials or hazardous wastes shall be allowed to come in contact with storm water discharges. If such contact occurs, the storm water discharge shall be contained on site until appropriate measures in compliance with state and federal regulations are taken to dispose of the contaminated storm water.	
Report to the Operator, Engineer, local Fire Department, Joint Communications, local Sheriff’s Department, City of Columbia Public Works, MDNR, and EPA any noncompliance with the SWPPP that will endanger public health or the environment. Also, if the spill contains a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under 40CFR110, 40CFR117, and 40CFR302, follow the directions on the Reportable Quantity Release Form which can be found in Appendix M. Any information shall be provided orally immediately after the Contractor becomes aware of the circumstances. A written submission shall also be provided	



to Engineer, Owner, City of Columbia Public Works, MDNR, and EPA within five (5) days of the time the Contractor becomes aware of the circumstances. The following events require immediate verbal: a) any unanticipated bypass which exceeds any effluent limitation in the permit, b) any upset which exceeds any effluent limitation in the permit, and c) a violation of a maximum daily discharge limitation for any of the pollutants listed by the MDNR in the permit. The written submission shall contain a description of the non-compliance and its cause; the period of non-compliance, including exact dates and times, and if the non-compliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the non-compliance.

- a) In order to minimize the potential for a spill of hazardous materials to come into contact with storm water, the following steps shall be implemented:
  - (i) All materials with hazardous properties (such as pesticides, petroleum products, fertilizers, detergents, construction chemicals, acids, paints, paint solvents, cleaning solvents, additives for soil stabilization, concrete curing compounds and additives, etc.) shall be stored in a secure location, with their lids on, preferably under cover, when not in use.
  - (ii) The minimum practical quantity of all such materials shall be kept on the job site.
  - (iii) A spill control and containment kit (containing, for example, absorbent materials, acid neutralizing powder, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.) shall be provided at the storage site.
  - (iv) Manufacturer's recommended methods for spill cleanup shall be clearly posted and site personnel shall be trained regarding these procedures and the location of the information and cleanup supplies.
- b) In the event of a spill, the following procedures shall be followed:
  - (i) All spills shall be cleaned up immediately after discovery.
  - (ii) The spill area shall be kept well ventilated and personnel shall wear appropriate protective clothing to prevent injury from contact with the hazardous substances.
  - (iii) The project manager and the Engineer of Record shall be notified immediately.
  - (iv) Spills of toxic or hazardous materials shall be reported to the appropriate federal, state, and/or local government agency, regardless of the size of the spill. Spills of amounts that exceed Reportable Quantities of certain substances specifically mentioned in federal regulations (40 CFR 110, 40 CFR 117, and 40 CFR 302) shall be immediately reported to the EPA National Response Center, telephone 1-800-424-8802. Contact the Operator, Engineer, local Fire Department, Joint Communications, local Sheriff's Department, City of Columbia Public Works, MDNR, and EPA immediately after the onset of a "hazardous condition". The applicant shall notify by telephone and in writing the Department of Natural Resources, Water Pollution Control Program, Post Office Box 176, Jefferson City, MO 65102, 1-800-361-4827, of any oil spills or if hazardous substances are found during the prosecution of work under this permit.
  - (v) If the spill exceeds a Reportable Quantity, the SWPPP shall be modified within seven (7) calendar days of knowledge of the discharge to provide a description of the release, the circumstances leading to the release, and the date of the release, the plans shall identify measures to prevent the recurrence of such releases and to respond to such releases. The Reportable Quantity Release form located in Appendix M shall be completed in accordance with this requirement.
- c) The Spill Prevention and Response Coordinator shall designate the individuals who shall receive spill prevention and response training. These individuals shall each become responsible for a particular phase of prevention and response. The names of these personnel shall be posted in the material storage area and in the office trailer/construction headquarters onsite.

<b>BMP:</b>	<b>Soil Contamination</b>
Responsible Staff:	
Spill Prevention & Response Coordinator:	
Installation Schedule:	Training will begin prior to the start of project construction. All other procedures shall begin with the start of project construction.
<b>Description:</b>	
Soil contamination is either solid or liquid hazardous substances mixed with the naturally occurring soil. Soil contamination results when hazardous substances are either spilled or buried directly in the soil or migrate to the soil from a spill that has occurred elsewhere. Soil contamination is typically identified in the field via visual and/or odor means. No soil contamination is known to exist on the site pre construction. If it is suspected contaminated soil has been discovered onsite or if soil contamination occurs resulting from spills of materials with hazardous properties the Operator shall be immediately notified. Immediate contamination procedures per federal, state, and local requirements shall be implemented by the Contractor. A plan to permanently mitigate the contaminated soil shall be developed by the Contractor and Operator that adheres to all federal, state, and local requirements. The plan shall be implemented by the Contractor.	

**5.6 ANY ADDITIONAL BMPS**

None.

**5.7 ALLOWABLE NON-STORMWATER DISCHARGE MANAGEMENT**

Certain non-stormwater discharges are allowed under the Missouri State Operating Permit – General Operating Permit for land disturbance, and it is the intent of this SWPPP to allow such discharges. These types of discharges shall be allowed under the conditions that no pollutants shall be allowed to come in contact with the discharge water prior to or after its discharge. The control measures which have been outlined previously in this SWPPP shall be strictly followed to ensure that no contamination of these non-stormwater discharges takes place. The following allowable non-stormwater discharges which may occur from the job site include:

- a) Discharges from firefighting activities
- b) Fire hydrant flushing (see note below)
- c) Waters used to wash vehicles where detergents are not used
- d) Waters used to control dust. Water used in fashion shall only be applied so there is no site runoff.
- e) Potable water sources such as waterline flushing (see note below), landscape irrigation, routine exterior building wash down that does not use detergent (see note below)
- f) Pavement wash waters where spills or leaks of hazardous materials have not occurred or detergents have not been used
- g) Air conditioning condensate
- h) Springs and other uncontaminated groundwater, including dewatering ground water infiltration
- i) Foundation or footing drains where no contamination with process materials such as solvents is present

NOTE: The Contractor shall neutralize any super-chlorinated water from water distribution pipes before releasing it into the environment. Neutralization techniques are available from the Operator’s Engineer.

**SECTION 6: INSPECTIONS**

**6.1 ROUTINE INSPECTIONS**

Routine inspections are required at least once every seven (7) calendar days and within 24 hours following a rainfall

event that produces runoff. Particular BMP inspection details are included in Sections 4 and 5 of this SWPPP. Written documentation in the form of inspection reports and redlined SWPPP maps must be kept on file with the SWPPP at the jobsite and made available to the Operator, Operator's engineer, USEPA, state and local agencies that have issued land disturbance permits, and any other agency with regulatory authority over stormwater. Inspection report forms are included in Appendix H. In addition, copies of the reports shall be provided by the Contractor to any of these persons, upon request, via mail, email, or facsimile transmission. Also included in Appendix H is a Recommended Inspection Sequence for informational purposes only. Additional inspection requirements are given in the permits in Appendix A.

It is encouraged to take photos during inspections, print them out, and keep them on file with the corresponding inspection report with the onsite SWPPP.

## 6.2 NON ROUTINE/SPOT INSPECTIONS

High use or high maintenance BMPs (typically construction entrance/exit, street sweeping, trash dumpsters, etc.) should be inspected on a daily basis or as deemed necessary to verify they are functioning properly. Weather reports should be monitored and inspections should take place before large storm events to ensure all BMPs are fully operational before the storm event occurs. Inspect some BMPs during rain events to ensure they are keeping sediment onsite.

## 6.3 FINAL STABILIZATION

Inspection workload can be reduced by defining certain areas onsite as achieving final stabilization. Final stabilization is defined as when 70% permanent vegetation or permanent materials (buildings, pavement, etc) cover all disturbed areas within the defined area. Once final stabilization is achieved, these areas can be marked on the SWPPP map(s) and inspections can discontinue in these areas only.

## 6.4 BMP INSPECTORS

A BMP inspection is only as good as the inspector. Therefore it is important that designated inspectors/responsible parties be qualified, trained personnel. Personnel selected to conduct inspections should be knowledgeable in the principles and practices of erosion and sediment controls, possess the technical skills to assess conditions at the construction site that could impact stormwater quality, and assess the effectiveness of any sediment and erosion control measures selected.

## 6.5 DESIGNATED INSPECTORS

*(to be filled in by Contractor after award of contract, make copies of this form as necessary)*

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

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

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

Inspector Cell Phone: \_\_\_\_\_ Email: \_\_\_\_\_

Qualifications: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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

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

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

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Inspector Cell Phone: \_\_\_\_\_ Email: \_\_\_\_\_

Qualifications: \_\_\_\_\_

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

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

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

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Inspector Cell Phone: \_\_\_\_\_ Email: \_\_\_\_\_

Qualifications: \_\_\_\_\_

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## SECTION 7: RECORDKEEPING AND TRAINING

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### 7.1 RECORDKEEPING

The following is a list of records you should keep at your project site bound with the SWPPP and available for inspectors to review:

1. Maintain Copies of Permits and Forms, including:
  - State Land Disturbance Permit (Appendix A)
  - Local Land Disturbance Permit - if required (Appendix A)
  
2. Certification Records, including:
  - Authorized Representative Designation (Appendix C)
  - Authorized Representative Certification (Appendix D)
  - Subcontractors Certification (Appendix F)
  
3. Maintain Records of Construction Activities, including:
  - Implementation Schedule (Appendix G)
  - Dates & locations when major grading activities occur (see below)
  - Dates when construction activities temporarily cease on a portion of the site (see below)
  - Dates when construction activities permanently cease on a portion of the site (see below)
  - Dates when stabilization measures are initiated on the site (see below)
  - SWPPP maps showing the location and dates of installation of structural and non-structural BMPs (Section 3.13)
  - SWPPP maps showing the location and dates of installation of good housekeeping BMPs (Section 3.13)
  - Dates of rainfall and the amount of rainfall (Appendix N)
  - Records of reports filed with regulatory agencies if reportable quantities of hazardous materials spilled (Appendix M)
  
4. Maintain Inspection & Maintenance Records, including:
  - Inspection Reports (Appendix H)
  - SWPPP Amendment Report Form (Appendix I)
  - Overall SWPPP Amendment Log (Appendix I)
  
5. General Required Records, including:
  - List of Subcontractors (Appendix E)
  - Record Of Personnel Training Activities Form (Appendix L)
  - TMDL Documentation (303d Impaired Waterway) (Appendix P)

6. Termination Records, including:

- Notice of Termination from state (Appendix O) (if applicable)
- Notice of Termination from Local Authority (Appendix O) (if applicable)
- Final Stabilization/Termination Checklist (Appendix O)

7. Additional Required Records, including:

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

Date(s) & location(s) when major grading activities occur: \_\_\_\_\_

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Date(s), location(s), & reason(s) when construction activities temporarily cease on a portion of the site: \_\_\_\_\_

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Date(s) & location(s) when construction activities permanently cease on a portion of the site: \_\_\_\_\_

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Date(s) & area(s) when an area is either temporarily or permanently stabilized (indicate temporary or permanent): \_\_\_\_\_

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Upon termination of the land disturbance permit, the Contractor shall turn over all SWPP documentation and maps

to the Operator. Inspection and maintenance report forms are to be maintained by the Operator for three years following the final stabilization of the site.

## 7.2 LOG OF CHANGES TO THE SWPPP

The SWPPP is meant to be a dynamic working guide that is to be kept current, effective, and functional in meeting its objectives at all times. Unforeseen or unexpected circumstances can require modification and amendment to the SWPPP. The SWPPP shall be amended whenever there is a change in design, construction, operation, or maintenance at the construction site that has a significant effect on the discharge of pollutants to the waters of the United States that has not been previously addressed in the SWPPP, if inspections or investigations by site staff, local, state, or federal officials determine that discharges are causing water quality exceedances or the SWPPP is ineffective in eliminating or significantly minimizing pollutants in storm water discharges from the construction site, or based on the results of an inspection, or there is a release containing a Hazardous Substance, or Oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302 occurs during a 24 hour period, the SWPPP shall be modified to include additional or modified BMPs designed to correct identified problems. Revisions shall be completed within seven (7) calendar days following the inspection. Modifications that are the result of inspections shall be initiated within 24 hours and completed within 48 hours. The Contractor shall be responsible for SWPPP modifications/amendments whenever the following occurs:

- a) Addition of new BMP(s) or replacement of failing or failed BMP(s).
- b) Design, operation, inspection, or maintenance of BMP(s) is changed.
- c) Design/scope/schedule of the construction project is changed that could affect the quality of storm water discharges.
- d) Updates/revisions to site maps/plans.
- e) Inspections indicate deficiencies in the SWPPP or any BMP.
- f) Changes in Operator, contractor(s), subcontractor(s) or other personnel.
- g) Federal, state, or local authorities notify the Operator/permittee/contractor in writing of deficiencies found onsite regarding stormwater control.
- h) SWPPP is determined to be ineffective in significantly minimizing or controlling erosion and sedimentation (e.g., excessive site erosion or excessive sediment deposits downstream of any stormwater outfall, etc.).
- i) If Total Settleable Solids (TSS) from a storm water outfall exceed the amount as defined in the operating permit.
- j) Federal, state, or local authorities determine violations of Water Quality Standards may occur or have occurred.

Any such changes to the SWPPP must be made in writing and signed and dated by the Contractor's representative. A form has been provided in Appendix I for this purpose. Modifications of the SWPPP BMPs shall be indicated via redlines on the SWPPP maps. The SWPPP must also be amended to identify any new contractor and/or subcontractor that will be responsible for any aspect of the SWPPP. Notification of any modifications or amendments to the SWPPP must be made in writing to both the Operator and the Operator's Engineer within 7 days of the date such modification or amendment is made.

An overall log of SWPPP amendments shall be kept and included with the onsite SWPPP. An amendment log is included in Appendix I.

## 7.3 TRAINING

Onsite contractor(s), subcontractor(s), and staff might not be familiar with stormwater BMPs, and they might not understand their role in protecting local rivers, lakes, and coastal waters. Proper training of personnel can be one of the most effective BMPs implemented at a jobsite. The Contractor shall be responsible for basic training of all onsite staff. As with the other steps taken to prevent stormwater problems at the project site, all training conducted for staff, for those with specific stormwater responsibilities, and for subcontractors shall be documented. Training documentation forms are included in Appendix L and shall become an integral part of the onsite SWPPP. Training shall adhere to the following requirements:

Basic training shall educate the attendees on the topics of:

- a) An awareness of the SWPPP, its purpose, and the basics of how the purpose is being achieved.
- b) Spill prevention and cleanup measures, including prohibition of dumping any material into storm drains or waterways.
- c) An understanding of the basic purpose of BMP's, including what BMP's are on site, what they should look like, and how to avoid damaging them.
- d) Potential penalties associated with stormwater non compliance.

Entities and subcontractor directly responsible for implementing the SWPPP shall receive comprehensive stormwater training including:

- e) The location and type of BMP's being implemented
- f) The installation requirements and water quality purpose for each BMP
- g) Maintenance procedures for each of the BMP's being implemented
- h) Spill prevention and cleanup measures
- i) Inspection and maintenance record keeping requirements

Each person working on the site shall be informed of the following:

- j) Only designated construction site entrances shall be used for entering and exiting the site
- k) Equipment shall be kept away from silt fences, fiber rolls, and other sediment barriers
- l) Know the locations of disposal areas, and know the proper practices for trash, concrete and paint washout, hazardous chemicals, etc.
- m) Soil, materials, and liquids shall be kept away from paved areas and storm drain inlets. Material shall not be swept or washed into a storm drain
- n) Know the location and understand the proper use of spill kits
- o) Know the locations of the site's designated protection areas. Equipment shall be kept away from stream banks, valuable trees and shrubs, and steep slopes. Clearly mark these areas
- p) Equipment shall be kept off mulched, seeded, or stabilized areas. Clearly mark these areas
- q) Know who to contact when problems are identified

## **SECTION 8: TERMINATION OF PERMIT COVERAGE**

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Final stabilization is defined by the state Operating Permit – General Operating Permit when perennial vegetation, pavement, buildings, or structures using permanent materials cover all areas that have been disturbed. With respect to areas that have been vegetated, vegetative cover shall be at least 70% of fully established plant density over 100% of the disturbed area. When final stabilization has been achieved over all disturbed areas, and the facility no longer discharges stormwater associated with construction activities, a Final Stabilization/Termination Checklist shall be completed and signed by the Contractor and submitted to the Operator. Once the operator has approved the checklist, the Contractor shall proceed with terminating all land disturbance permits. To terminate the state permit, a Request for Termination of Operating Permit form shall be filed by the Contractor (Appendix O). To terminate the local land disturbance permit, the Contractor shall write a letter to the local authority requesting termination of the permit. The Contractor shall follow up with both the state and local permit authorities to verify the land disturbance permits have been terminated. Verification shall be placed in Appendix O. Termination of all land disturbance permits terminates the Operators and Contractors responsibility to implement the SWPPP.

An Application for Transfer of Operating Permit should be filed when the Operator is no longer the operator of the facility (typically a change of ownership). Once received, the Application and approval letter from the State should be placed in Appendix O of this document. A new MDNR Operating Permit – General Operating Permit should be obtained for the new Operator via the epermitting process described in Section 1. When received, the new General Operating Permit should be placed in Appendix A.



## **APPENDIX A**

### **LAND DISTURBANCE PERMIT(S)**

STATE OF MISSOURI  
DEPARTMENT OF NATURAL RESOURCES  
MISSOURI CLEAN WATER COMMISSION



## MISSOURI STATE OPERATING PERMIT

### General Operating Permit

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No MOR100039

Owner: Curators of University of Missouri  
Address: 180 General Services Building  
Columbia, MO 65211

Continuing Authority: University of Missouri  
180 General Services Building  
Columbia, MO 65211

Facility Name: University of Missouri  
Facility Address: 180 General Services Building  
COLUMBIA, MO 65211

Legal Description: Sec. 13, T48N, R13W, Boone County  
UTM Coordinates: 557759.000/4309955.000  
Receiving Stream: Tributary to Hinkson Cr. (U)  
First Classified Stream - ID#: Hinkson Cr. (C) 1008.00  
USGS# and Sub Watershed#: 10300102 - 0603

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein.

### **FACILITY DESCRIPTION** All Outfalls SIC #1629

All Outfalls - Construction or land disturbance activity (e.g., clearing, grubbing, excavating, grading, filling and other activity that results in the destruction of the root zone and/or land disturbance activity that is reasonably certain to cause pollution of waters of the state)

Issued to a city, county, state or federal agency, other governmental jurisdiction, or other private area-wide projects as determined by the Department on a case-by-case basis

This permit authorizes only wastewater, including storm water, discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System, it does not apply to other regulated areas. This permit may be appealed in accordance with RSMo Section 644.051.6 and 621.250, 10 CSR 20-6.020, and 10 CSR 20-1.020.

July 05, 2022

Issue Date

Chris Wieberg, Director  
Water Protection Program

July 04, 2027

Expiration Date

## I. APPLICABILITY

### A. Permit Coverage and Authorized Discharges

1. This Missouri State Operating Permit (permit) authorizes the discharge of stormwater and certain non-stormwater discharges from land disturbance sites that disturb one or more acres, or disturb less than one acre when part of a larger common plan of development or sale that will disturb a cumulative total of one or more acres over the life of the project.

A Missouri State Operating Permit must be issued before any site vegetation is removed or the site disturbed. Any site owner/operator subject to these requirements for stormwater discharges and who disturbs land prior to permit issuance from the Missouri Department of Natural Resources (Department) is in violation of both State regulations per 10 CSR 20-6.200(1)(A) and Federal regulations per 40 CFR 122.26. The owner/operator of this permit is responsible for compliance with this permit [10 CSR 20-6.200 (3)(B)].

2. This general permit is issued to a city, county, state or federal agency, other governmental jurisdiction, or other private area-wide projects as determined by the Department on a case-by-case basis, for land disturbance projects performed by or under contract to the permittee.
3. This permit authorizes stormwater discharges from land disturbance support activities (e.g., equipment staging yards, material storage areas, excavated material disposal areas, borrow areas, concrete, or asphalt batch plants) provided appropriate stormwater controls are designed, installed, and maintained and the following conditions are met and addressed in the Stormwater Pollution Prevention Plan (SWPPP). The permittee is responsible for compliance with this permit for any stormwater discharges from construction support activity.
  - (a) The support activity is directly related to the construction site required to have permit coverage for stormwater discharges;
  - (b) The support activity is not a commercial operation or serve multiple unrelated construction sites;
  - (c) The support activity does not continue to operate beyond the completion of the construction activity at the project it supports;
  - (d) Sediment and erosion controls are implemented in accordance with the conditions of this permit; and
  - (e) The support activity is strictly stormwater discharges or non-stormwater discharges listed in PART I, APPLICABILITY, Condition A.4. Support activities which discharge process water shall apply for separate coverage (e.g., a concrete batch plant discharging process water shall be covered under a MOG49).
4. This permit authorizes non-stormwater discharges associated with your construction activity from the following activities provided that these discharges are treated by appropriate Best Management Practices (BMPs) where applicable and addressed in the permittee's site specific SWPPP required by this general permit:
  - (a) Discharges from emergency fire-fighting activities;
  - (b) Hydrant flushing and water line flushing, provided the discharged water is managed to avoid instream water quality impacts;
  - (c) Landscape watering, including to establish vegetation;
  - (d) Water used to control dust;
  - (e) Waters used to rinse vehicles and equipment, provided there is no discharge of soaps, solvents, or detergents used for such purposes;
  - (f) External building washdown, provided soaps, solvents, and detergents are not used, and external surfaces do not contain hazardous substances (e.g., paint or caulk containing polychlorinated biphenyls (PCBs))
  - (g) Pavement wash waters, provided spills or leaks of toxic or hazardous substances have not occurred (unless all spill material has been removed) and where soaps, solvents, and detergents are not used. Directing pavement wash waters directly into any water of the state, storm drain inlet, or stormwater conveyance (constructed or natural site drainage features), unless the conveyance is connected to an effective control, is prohibited;
  - (h) Uncontaminated air conditioning or compressor condensate;
  - (i) Uncontaminated, non-turbid discharges of ground water or spring water;
  - (j) Foundation or footing drains where flows are not contaminated with process materials; and
  - (k) Uncontaminated construction dewatering water discharged in accordance with requirements found in this permit for specific dewatering activities.

## **B. Permit Restrictions and Limitations**

1. This permit does not authorize the discharge of process wastewaters, treated or otherwise.
2. For sites operating within the watershed of any Outstanding National Resource Water (which includes the Ozark National Riverways and the National Wild and Scenic Rivers System), sites that discharge to an Outstanding State Resource Water, or facilities located within the watershed of an impaired water as designated in the Clean Water Act (CWA) Section 303(d) list with an impairment for sedimentation/siltation:
  - (a) This permit authorizes stormwater discharge provided no degradation of water quality occurs due to discharges from the permitted facility per 10 CSR 20-7.031(3)(C).
  - (b) A site with a discharge found to be causing degradation or contributing to an impairment by discharging a pollutant of concern, during an inspection or through complaint investigations, may be required to become a no discharge facility or obtain a site-specific permit with more stringent monitoring and SWPPP requirements.
3. This permit does not allow placement of fill material into any stream or wetland, alteration of a stream channel, or obstruction of stream flow unless the appropriate CWA Section 404 permitting authority provides approval for such actions or determines such actions are exempt from Section 404 jurisdiction. Additionally, this permit does not authorize placement of fill in floodplains unless approved or determined exempt by appropriate federal and/or state floodplain development authorities.
4. This operating permit does not affect, remove, or replace any requirement of the National Environmental Policy Act; the Endangered Species Act; the National Historic Preservation Act; the Comprehensive Environmental Response, Compensation and Liability Act; the Resource Conservation and Recovery Act; or any other relevant acts. Determination of applicability to the above mentioned acts is the responsibility of the permittee. Additionally, this permit does not establish terms and conditions for runoff resulting from silvicultural activities listed in Section 402(l)(3)(a) of the Clean Water Act.
5. Compliance with all requirements in this permit does not supersede any requirement for obtaining project approval from an established local authority nor remove liability for compliance with county and other local ordinances.
6. The Department may require any facility or site authorized by a general permit to apply for a site-specific permit [10 CSR 20-6.010(13)(C)].
7. If a facility or site covered under a current general permit desires to apply for a site-specific permit, the facility or site may do so by contacting the Department for application requirements and procedures.
8. Any discharges not expressly authorized in this permit and not clearly disclosed in the permit application cannot become authorized or shielded from liability under CWA section 402(k) or Section 644.051.16, RSMo, by disclosure to EPA, state, or local authorities after issuance of this permit via any means, including any other permit applications, funding applications, the SWPPP, discharge monitoring reporting, or during an inspection. Discharges at the facility not expressly authorized by this permit must be covered by another permit, be exempt from permitting, or be authorized through some other method.

## **II. EXEMPTIONS FROM PERMIT REQUIREMENTS**

1. Sites that discharge all stormwater runoff directly to a combined sewer system (as defined in 40 CFR 122.26 and 40 CFR 35.2005) connecting to a publicly owned treatment works which has consented to receive such a discharge are exempt from Department stormwater permit requirements.
2. Land disturbance activities that disturb less than one (1) acre of total land area which are not part of a common plan or sale where water quality standards are not exceeded are exempt from Department stormwater permit requirements.

3. Oil and gas related activities as listed in 40 CFR 122.26(a)(2)(ii) where water quality standards are not exceeded are exempt from Department stormwater permit requirements.
4. Linear, strip, or ribbon construction or maintenance operations meeting one (1) of the following criteria are exempt from Department stormwater permit requirements:
  - (a) Grading of existing dirt or gravel roads which does not increase the runoff coefficient and the addition of an impermeable surface over an existing dirt or gravel road;
  - (b) Cleaning or routine maintenance of roadside ditches, sewers, waterlines, pipelines, utility lines, or similar facilities;
  - (c) Trenches two (2) feet in width or less; or
  - (d) Emergency repair or replacement of existing facilities as long as BMPs are employed during the emergency repair.

### **III. REQUIREMENTS**

1. The permittee shall post a public notification sign at the main entrance to the site, or a publically visible location, with the specific MOR100 permit number. The public notification sign must be visible from the public road that provides access to the site's main entrance. An alternate location is acceptable provided the public can see it and it is noted in the SWPPP. The public notification sign must remain posted at the site until the site is finalized.
2. The permittee shall be responsible for notifying the land owner and each contractor or entity (including utility crews and city employees or their agents) who will perform work at the site of the existence of the SWPPP and what actions or precautions shall be taken while on site to minimize the potential for erosion and the potential for damaging any BMP. The permittee is responsible for any damage a subcontractor may do to established BMPs and any subsequent water quality violation resulting from the damage.
3. Ensure the design, installation, and maintenance of effective erosion and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed, and maintained to:
  - (a) Control stormwater volume, velocity, and peak flow rates to minimize soil erosion;
  - (b) Control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion and scour;
  - (c) Minimize the amount of exposed soil during construction activity;
  - (d) Minimize the disturbance of steep slopes;
  - (e) Minimize sediment discharges from the site. Address factors such as:
    - 1) The amount, frequency, intensity, and duration of precipitation;
    - 2) The nature of resulting stormwater runoff;
    - 3) Expected flow from impervious surfaces, slopes, and drainage features; and
    - 4) Soil characteristics, including the range of soil particle size expected to be present on the site.
  - (f) Provide and maintain natural buffers around surface waters as detailed in Part V. BMP REQUIREMENTS Condition 7, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration and filtering, unless infeasible; and
  - (g) Minimize soil compaction and preserve topsoil where practicable.

A 2-year, 24-hour storm event can be determined for the project location using the National Oceanic and Atmospheric Administration's National Weather Service Atlas 14 which can be located at [https://hdsc.nws.noaa.gov/hdsc/pfds/pfds\\_map\\_cont.html](https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html), or the permittee can determine local rainfall distribution for a 2-year, 24 hours storm event using multi-decade local high density rain gauge data, as approved by the Department.

4. BMPs for land disturbance [10 CSR 20-6.200(1)(D)2] are a schedule of activities, practices, or procedures that reduces the amount of soil available for transport or a device that reduces the amount of suspended solids in runoff before discharge to waters of the state. The term BMPs are also used to describe the sediment and erosion controls and other activities used to prevent stormwater pollution. BMPs are divided into two main categories: structural or non-structural; and they are also classified as temporary or permanent. Temporary BMPs may be added and removed as necessary with updates to the SWPPP as specified in the requirements below.

5. Installation of BMPs necessary to prevent soil erosion and sedimentation at the downgradient project boundary (e.g. buffers, perimeter controls, exit point controls, storm drain inlet protection) must be complete prior to the start of all phases of construction. By the time construction activity in any given portion of the site begins, downgradient BMPs must be installed and operational to control discharges from the initial site clearing, grading, excavating, and other earth-disturbing activities. Additional BMPs shall be installed as necessary throughout the life of the project.
6. All BMPs shall be maintained and remain in effective operating condition during the entire duration of the project, with repairs made within the timeframes specified elsewhere in this permit, until final stabilization has been achieved.
  - (a) Ensure BMPs are protected from activities that would reduce their effectiveness.
  - (b) Remove any sediment per the BMP manufacturer's instructions or before it has accumulated to one-half of the above-ground height of any BMP that collects sediment (i.e., silt fences, sediment traps, etc.)
  - (c) The project is considered to achieve final stabilization when Part V. BMP REQUIREMENTS, Condition 13 is met.
7. Minimize sediment trackout from the site and sediment transport onto roadways.
  - (a) Restrict vehicle traffic to designated exit points.
  - (b) Use appropriate stabilization techniques or BMPs at all points that exit onto paved roads or areas outside of the site.
  - (c) Use additional controls or BMPs to remove sediment from vehicle and equipment tires prior to exit from facility where necessary.
  - (d) Any sediment or debris that is tracked out past the exit pad or is deposited on a roadway after a precipitation event shall be removed by the shorter of either the same business day (for business days only), or by the end of the next business day if track-out occurs on a non-business day, and before predicted rain events. Remove the track-out sediment by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. Sediment or debris tracked out on pavement or other impervious surfaces shall not be disposed of into any stormwater conveyance, storm drain inlet, or water of the state.
  - (e) Stormwater inlets susceptible to receiving sediment or other pollutants from the permitted land disturbance site shall have curb inlet protection. This may include inlets off the active area where track out from vehicles and equipment could impact the stormwater runoff to those inlets.
8. Concrete washout facilities shall be used to contain concrete waste from the activities onsite, unless the washout of trucks and equipment is managed properly at an off-site location. The washout facility shall be managed to prevent solid and/or liquid waste from entering waters of the state by the following:
  - (a) Direct the wash water into leak-proof containers or pits designed so that no overflows can occur due to inadequate sizing or precipitation;
  - (b) Locate washout activities away from waters of the state, stormwater inlets, and/or stormwater conveyances where practicable. If not practicable, use BMPs to reduce risk of waste leaving the washout facility;
  - (c) Washout facilities shall be cleaned, or new facilities must be constructed and ready for use, once the washout is 75% full;
  - (d) Designate the washout area(s) and conduct such activities only in these areas.
  - (e) Ensure contractors are aware of the location, such as by marking the area(s) on the map or signage visible to the truck and/or equipment operators.
9. Good housekeeping practices shall be maintained at all times to keep waste from entering waters of the state.
  - (a) Provide solid and hazardous waste management practices, including providing trash containers, regular site cleanup for proper disposal of solid waste such as scrap building material, product/material shipping waste, food/beverage containers, spent structural BMPs;
  - (b) Provide containers and methods for proper disposal of waste paints, solvents, and cleaning compounds.
  - (c) Manage sanitary waste. Portable toilets shall be positioned so that they are secure and will not be tipped or knocked over and so that they are located away from waters of the state and stormwater inlets and stormwater conveyances.
  - (d) Ensure the storage of construction materials be kept away from drainage courses, stormwater conveyances, storm drain inlets, and low areas.

10. All fueling facilities present shall at all times adhere to applicable federal and state regulations concerning underground storage, above ground storage, and dispensers.
11. Any hazardous wastes that are generated onsite shall be managed, stored, and transported according to the provisions of the Missouri Hazardous Waste Laws and Regulations.
12. Store all paints, solvents, petroleum products, petroleum waste products, and storage containers (such as drums, cans, or cartons) so they are not exposed to stormwater or provide other prescribed BMPs (such as plastic lids and/or portable spill pans) to prevent the commingling of stormwater with container contents. Commingled water may not be discharged under this permit. Provide spill prevention, control, and countermeasures to contain the spill. Any containment system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall prevent the contamination of groundwater.
13. Implement measures intended to prevent the spillage or loss of fluids, oil, grease, fuel, etc. from vehicles and equipment to thereby prevent the contamination of stormwater from these substances. This may include prevention measures such as, but not limited to, utilizing drip pans under vehicles and equipment stored outdoors, covering fueling areas, using dry clean-up methods, use of absorbents, and cleaning pavement surfaces to remove oil and grease.
14. Spills, Overflows, and Other Unauthorized Discharges.
  - (a) Any spill, overflow, or other discharge not specifically authorized in the permit above are unauthorized.
  - (b) Should an unauthorized discharge cause or permit any contaminants, other than sediment, or hazardous substance to discharge or enter waters of the state, the unauthorized discharge must be reported to the regional office as soon as practicable but no more than 24 hours after the discovery of the discharge. If the spill or overflow needs to be reported after normal business hours or on the weekend, the facility must call the Department's Environmental Emergency Response hotline at (573) 634-2436. Leaving a message on a Department staff member voice-mail does not satisfy this reporting requirement.
  - (c) A record of all spills shall be retained with the SWPPP and made available to the Department upon request.
  - (d) Other spills not reaching waters of the state must be cleaned up as soon as possible to prevent entrainment in stormwater but are not required to be reported to the Department.
15. The full implementation of this operating permit shall constitute compliance with all applicable federal and state statutes and regulations in accordance with RSMo 644.051.16 and the CWA §402(k); however, this permit may be reopened and modified or alternatively revoked and reissued to comply with any applicable effluent standard or limitation issued or approved under Clean Water Act §§ 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) if the effluent standard or limitation so issued or approved contains different conditions or is otherwise more stringent than any effluent limitation in the permit or controls any pollutant not limited in the permit. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, termination, notice of planned changes, or anticipated non-compliance does not stay any permit condition.

#### **IV. STORMWATER POLLUTION PREVENTION PLAN (SWPPP) MANAGEMENT REQUIREMENTS**

1. The primary requirement of this permit is the development and implementation of a SWPPP which incorporates site specific practices to best minimize the soil exposure, soil erosion, and the discharge of pollutants, including solids for each site covered under this permit.

The purpose of the SWPPP is to ensure the design, implementation, management, and maintenance of BMPs in order to prevent sediment and other pollutants in stormwater discharges associated with the land disturbance activities [40 CFR 122.44 (k)(4)] from entering waters of the state above established general and narrative criteria; compliance with Missouri Water Quality Standards; and compliance with the terms and conditions of this general permit.

- (a) **The SWPPP must be developed and implemented prior to conducting any land disturbance activities and must be specific to the land disturbance activities at the site.**
- (b) The permittee shall fully implement the provisions of the SWPPP required under this permit as a condition of this general permit throughout the term of the land disturbance project. Failure to develop, implement, and maintain a SWPPP may lead to immediate enforcement action.

- (c) The SWPPP shall be updated any time site conditions warrant adjustments to the project or BMPs.
  - (d) Either an electronic copy or a paper copy of the SWPPP, and any required reports, must be accessible to anyone on site at all times when land disturbance operations are in process or other operational activities that may affect the maintenance or integrity of the BMP structures and made available as specified under Part VIII. STANDARD PERMIT CONDITIONS, Condition 1 of this permit. The SWPPP shall be readily available upon request and should not be sent to the Department unless specifically requested
2. Failure to implement and maintain the BMPs chosen, which can be revised and updated, is a permit violation. The chosen BMPs will be the most reasonable and cost effective while also ensuring the highest quality water discharged attainable for the facility. Facilities with established SWPPPs and BMPs shall evaluate BMPs on a regular basis and change the BMPs as needed if there are BMP deficiencies.
  3. The SWPPP must:
    - (a) List and describe the location of all outfalls;
    - (b) List any allowable non-stormwater discharges occurring on site and where these discharges occur;
    - (c) Incorporate required practices identified below;
    - (d) Incorporate sediment and erosion control practices specific to site conditions;
    - (e) Discuss whether or not a 404 Permit is required for the project; and
    - (f) Name the person(s) responsible for inspection, operation, and maintenance of BMPs. The SWPPP shall list the names and describe the role of all owners/primary operators (such as general contractor, project manager) responsible for environmental or sediment and erosion control at the land disturbance site.
  4. The SWPPP briefly must describe the nature of the land disturbance activity, including:
    - (a) The function of the project (e.g., low density residential, shopping mall, highway, etc.);
    - (b) The intended sequence and timing of activities that disturb the soils at the site; and
    - (c) Estimates of the total area expected to be disturbed by excavation, grading, or other land disturbance support activities including off-site borrow and fill areas;
  5. In order to identify the site, the SWPPP shall include site information including size in acres. The SWPPP shall have sufficient information to be of practical use to contractors and site construction workers to guide the installation and maintenance of BMPs.
  6. The function of the SWPPP and the BMPs listed therein is to prevent or minimize pollution to waters of the state. A deficiency of a BMP means it was not effective in preventing or minimizing pollution of waters of the state.

The permittee shall select, install, use, operate and maintain appropriate BMPs for the permitted site. The following manuals are acceptable resources for the selection of appropriate BMPs.

*Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites*, (Document number EPA 833-R-06-004) published by the United States Environmental Protection Agency (USEPA) in May 2007. This manual as well as other information, including examples of construction SWPPPs, is available at the USEPA internet site at [https://www.epa.gov/sites/production/files/2015-10/documents/sw\\_swppp\\_guide.pdf](https://www.epa.gov/sites/production/files/2015-10/documents/sw_swppp_guide.pdf); and <https://www.epa.gov/npdes/developing-stormwater-pollution-prevention-plan-swppp>.

The latest version of *Protecting Water Quality: A field guide to erosion, sediment and stormwater best management practices for development sites in Missouri*, published by the Department. This manual is available at: <https://dnr.mo.gov/document-search/protecting-water-quality-field-guide>.

The permittee is not limited to the use of these guidance manuals. Other guidance publications may be used to select appropriate BMPs. However, all BMPs must be described and justified in the SWPPP. Although the use of these manuals or other resources is recommended and may be used for BMP selection, they do not supersede the conditions of this permit. They may be used to inform in the decision making process for BMP selection but they are not themselves part of the permit conditions.



The permittee may retain the SWPPP, inspection reports, and all other associated documents (including a copy of this permit) electronically pursuant to RSMo 432.255. The documents must be made available to all interested persons in either paper or electronic format as required by this permit and the permittee must remit a copy (electronic or otherwise) of the SWPPP and inspection reports to the Department upon request.

7. The SWPPP must contain a legible site map, multiple maps if necessary, identifying:
  - (a) Site boundaries of the property;
  - (b) Locations of all waters of the state (including wetlands) within the site and half a mile downstream of the site's outfalls;
  - (c) Location of all outfalls;
  - (d) Direction(s) of stormwater flow (use arrows) and approximate slopes before and after grading activities;
  - (e) Areas of soil disturbance and areas that will not be disturbed (or a statement that all areas of the site will be disturbed unless otherwise noted);
  - (f) Location of structural and non-structural BMPs, including natural buffer areas, identified in the SWPPP;
  - (g) Locations where stabilization practices are expected to occur;
  - (h) Locations of on-site and off-site material, waste, borrow, or equipment storage areas and stockpiles;
  - (i) Designated points where vehicles will exit the site;
  - (j) Location of stormwater inlets and conveyances including ditches, pipes, man-made conduits, and swales; and
  - (k) Areas where final stabilization has been achieved.
  
8. An individual shall be designated by the permittee as the environmental lead. This environmental lead shall have knowledge in erosion, sediment, and stormwater control principles, knowledge of the permit, and the site's SWPPP. The environmental lead shall ensure all personnel and contractors understand any requirements of this permit may be affected by the work they are doing. The environmental lead or designated inspector(s) knowledgeable in erosion, sediment, and stormwater control principles shall inspect all structures that function to prevent or minimize pollution of waters of the state.
  
9. Throughout coverage under this permit, the permittee shall amend and update the SWPPP as appropriate during the term of the land disturbance activity. All SWPPP modifications shall be signed and dated. The permittee shall amend the SWPPP to incorporate any significant site condition changes which impact the nature and condition of stormwater discharges. At a minimum, these changes include whenever the:
  - (a) Location, design, operation, or maintenance of BMPs is changed;
  - (b) Design of the construction project is changed that could significantly affect the quality of the stormwater discharges;
  - (c) The permittee's inspections indicate deficiencies in the SWPPP or any BMP;
  - (d) Department notifies the permittee in writing of deficiencies in the SWPPP;
  - (e) SWPPP is determined to be ineffective in minimizing or controlling erosion and sedimentation (e.g., there is visual evidence of excessive site erosion or sediment deposits in streams, lakes, or downstream waterways, sediment or other wastes off site); and/or
  - (f) Department determines violations of water quality standards may occur or have occurred.
  
10. Site Inspections: The environmental lead, or a designated inspector, shall conduct regularly scheduled inspections. These inspections shall be conducted by a qualified person, one who is responsible for environmental matters at the site, or a person trained by and directly supervised by the person responsible for environmental matters at the site. Site inspections shall include, at a minimum, the following:
  - (a) For disturbed areas that have not achieved final stabilization, all installed BMPs and other pollution control measures shall be inspected to ensure they are properly installed, appear to be operational, and are working as intended to minimize the discharge of pollutants.
  - (b) For areas on site that have achieved either temporary or final stabilization, while at the same time active construction continues on other areas, ensure that all stabilization measures are properly installed, appear to be operational, and are working as intended to minimize the discharge of pollutants.
  - (c) Inspect all material, waste, borrow, and equipment storage and maintenance areas that are covered by this permit. Inspect for conditions that could lead to spills, leaks, or other accumulations of pollutants on the site.
  - (d) Inspect all areas where stormwater typically flows within the site, including drainage ways designed to divert, convey, and/or treat stormwater.

- (e) All stormwater outfalls shall be inspected for evidence of erosion, sediment deposition, or impacts to the receiving stream. If a discharge is occurring during an inspection, the inspector must observe and document the visual quality of the discharge and take note of the characteristics of the stormwater discharge, including turbidity, color; odor; floating, settled, or suspended solids; foam; oil sheen; and other indicators of stormwater pollutants.
  - (f) When practicable the receiving stream shall also be inspected for a minimum of 50 feet downstream of the outfall.
  - (g) The perimeter of the site shall be inspected for evidence of BMP failure to ensure concentrated flow does not develop a new outfall.
  - (h) The SWPPP must explain how the environmental lead will be notified when stormwater runoff occurs.
11. Inspection Frequency: All BMPs must be inspected in accordance to one of the schedules listed below. The inspection frequency shall be documented in the SWPPP, and any changes to the frequency of inspections, including switching between the options listed below, must be documented on the inspection form:
- (a) At least once every seven (7) calendar days and within 48 hours after any storm event equal to or greater than a 2-year, 24-hour storm has ceased during a normal work day or within 72 hours if the rain event ceases during a non-work day such as a weekend or holiday; or
  - (b) Once every 14 calendar days and within 24 hours of the occurrence of a storm event of 0.25 inches of precipitation or greater, or the occurrence of runoff from snowmelt. To determine if a storm event of 0.25 inches or greater has occurred on the site, the permittee shall either keep a properly maintained rain gauge on site, or obtain the storm event information from a weather station near the site location.
    - 1) Inspections are only required during the project's normal working hours.
    - 2) An inspection must be conducted within 24 hours of a storm event which has produced 0.25 inches. The inspection shall be conducted within 24 hours of the event end, or within 72 hours if the rain event ceases during a non-work day such as a weekend or holiday.
    - 3) If it is elected to inspect every 14 calendar days and there is a storm event at the site that continues for multiple days, and each day of the storm produces 0.25 inches or more of rain, the permittee shall conduct an inspection within 24 hours of the end of the storm or within 72 hours if the rain event ceases during a non-work day such as a weekend or holiday.
  - (c) Areas on site that have achieved stabilization, while at the same time active construction continues on other areas, may reduce inspection frequency to monthly, for those stabilized areas, if the following conditions exist:
    - 1) For areas where disturbed portions have undergone temporary stabilization, inspections shall occur at least once a month while stabilized and when re-disturbed shall follow either frequency outlined in (a),(b), or (c) above.
    - 2) Areas on site that have achieved final stabilization must be inspected at least once per month until the permit is terminated.
  - (d) If construction activities are suspended due to frozen conditions, the permittee may temporarily reduce site inspections to monthly until thawing conditions begin to occur if all of the following are met:
    - 1) Land disturbances have been suspended; and
    - 2) All disturbed areas of the site have been stabilized in accordance with Part V. BMP REQUIREMENTS, Condition 13.
    - 3) The change shall be noted in the SWPPP.
  - (e) Any basin dewatering shall be inspected daily when discharge is occurring. The discharge shall be observed and dewatering activities shall be ceased immediately if the receiving stream is being impacted. These inspections shall be noted on a log or on the inspection report.

If weather conditions or other issues prevent correction of BMPs within seven calendar days, the reasons for the delay must be documented (including pictures), and there must be a narrative explaining why the work cannot be accomplished within the seven day time period. The documentation must be filed with the regular inspection reports. The corrections shall be made as soon as weather conditions or other issues allow.

12. Site Inspection Reports: A log of each inspection and/or copy of the inspection report shall be kept readily accessible and must be made available upon request by the Department. Electronic logs are acceptable as long as reports can be provided within 24 hours. If inspection reports are kept off site, the SWPPP must indicate where they are stored. The inspection report shall be signed by the environmental lead or designated inspector (electronically or otherwise).
- (a) The inspection report is to include the following minimum information:
    - 1) Inspector's name and title.
    - 2) Date and time of inspection.
    - 3) Observations relative to the effectiveness of the BMPs and stabilization measures. The following must be

documented:

- a. Whether BMPs are installed, operational, and working as intended;
  - b. Whether any new or modified stormwater controls are needed;
  - c. Facilities examined for conditions that could lead to spill or leak;
  - d. Outfalls examined for visual signs of erosion or sedimentation at outfalls. Excessive erosion or sedimentation may be due to BMP failure or insufficiency. Response to observations should be addressed in the inspection report.
- 4) Corrective actions taken or necessary to correct the observed problem.
  - 5) Listing of areas where land disturbance operations have permanently or temporarily stopped.
13. Any structural or maintenance deficiencies for BMPs or stabilization measures shall be documented and corrected as soon as possible but no more than seven (7) calendar days after the inspection.
- (a) Corrective action documentation shall be stored with the associated site inspection report.
  - (b) Immediately take all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events.
  - (c) If weather conditions or other issues prevent correction of BMPs within seven calendar days, the reasons for the delay must be documented (this may include pictures) and there must be a narrative explaining why the work cannot be accomplished within the seven day time period. The permittee shall correct the problem as soon as weather conditions or issues allow.
  - (d) Corrective actions may be required by the Department. The permittee must comply with any corrective actions required by the Department as a result of permit violations found during an inspection.

## **V. BMP REQUIREMENTS**

1. The information, practices, and BMP requirements in this section shall be implemented on site and, where noted, provided for in the SWPPP.
2. Existing vegetation and trees shall be preserved where practicable. The permittee is encouraged to preserve topsoil where practicable.
3. The permittee shall select appropriate BMPs for use at the site and list them in the SWPPP. When selecting effective BMPs, the permittee shall consider stormwater volume and velocity. A BMP that has demonstrated ineffectiveness in preventing or minimizing sediment or other pollutants from leaving a given site shall be replaced with a more effective BMP, or additional and sequential BMPs and treatment devices may be incorporated as site conditions allow. The permittee should consider a schedule for performing erosion control measures when selecting BMPs.
4. The SWPPP shall include a description of both structural and non-structural BMPs that will be used at the site.
  - (a) The SWPPP shall provide the following general information for each BMP which will be used one or more times at the site:
    - 1) Physical description of the BMP;
    - 2) Site conditions that must be met for effective use of the BMP;
    - 3) BMP installation/construction procedures, including typical drawings; and
    - 4) Operation and maintenance procedures and schedules for the BMP.
  - (b) The SWPPP shall provide the following information for each specific instance where a BMP is to be installed:
    - 1) Whether the BMP is temporary or permanent;
    - 2) When the BMP will be installed in relation to each phase of the land disturbance procedures to complete the project; and
    - 3) Site conditions that must be met before removal of the BMP if the BMP is not a permanent BMP.
5. Structural BMP Installation: The permittee shall ensure all BMPs are properly installed and operational at the locations and relative times specified in the SWPPP.
  - (a) Perimeter control BMPs for runoff from disturbed areas shall be installed before general site clearing is started. Note this requirement does not apply to earth disturbances related to initial site clearing and establishing entry, exit, or access of the site, which may require that stormwater controls be installed immediately after the earth

- disturbance.
- (b) For phased projects, BMPs shall be properly installed as necessary prior to construction activities.
  - (c) Stormwater discharges which leave the site from disturbed areas shall pass through an appropriate impediment to sediment movement such as a sedimentation basin, sediment traps (including vegetative buffers), or silt fences prior to leaving the land disturbance site.
  - (d) A drainage course change shall be clearly marked on a site map and described in the SWPPP.
  - (e) If vegetative stabilization measures are being implemented, stabilization efforts are considered “installed” when all activities necessary to seed or plant the area are completed. Vegetative stabilization is not considered “operational” until the vegetation is established.
6. Install sediment controls along any perimeter areas of the site that are downgradient from any exposed soil or other disturbed areas. Prevent stormwater from circumventing the edge of the perimeter control. For sites where perimeter controls are infeasible, other practices shall be implemented to minimize discharges to perimeter areas of the site.
7. For surface waters of the state, defined in Section 644.016.1(27) RSMo, located on or adjacent to the site, the permittee must maintain a riparian buffer or structural equivalent in accordance with at least one of the following options. The selection and location must be described in the SWPPP.
- (a) Provide and maintain a 50-foot undisturbed natural buffer; or
  - (b) Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer; or
  - (c) If infeasible to provide and maintain an undisturbed natural buffer of any size, implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.
  - (d) The permittee is not required to comply with (a), (b), or (c) above if one or more of the following exceptions apply and documentation is provided in the SWPPP:
    - 1) As authorized per CWA Section 404 Department of the Army permit and its associated Section 401 Water Quality Certification from the Department.
    - 2) If there is no discharge of stormwater to waters of the state through the area between the disturbed portions of the site and waters of the state located within 50 feet of the site. This includes situations where the permittee has implemented permanent control measures that will prevent such discharges, such as a berm or other barrier.
    - 3) Where no natural buffer exists due to preexisting development disturbances that occurred prior to the initiation of planning for the current development of the site.
      - a. Where some natural buffer exists but portions of the area within 50 feet of the waters of the state are occupied by preexisting development disturbances the permittee is required to comply with (a), (b), or (c) above.
    - 4) For linear projects where site constraints make it infeasible to implement a buffer or equivalent provided the permittee limit disturbances within 50 feet of any waters of the state and/or the permittee provides supplemental erosion and sediment controls to treat stormwater discharges from earth disturbances within 50 feet of the water of the state. The permittee must also document in the SWPPP the rationale for why it is infeasible for the permittee to implement (a), (b), or (c) and describe any buffer width retained and supplemental BMPs installed.
  - (e) Where the permittee is retaining a buffer of any size, the buffer should be measured perpendicularly from any of the following points, whichever is further landward from the water:
    - 1) The ordinary high water mark of the water body, defined as the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, and/or the presence of litter and debris; or
    - 2) The edge of the stream or river bank, bluff, or cliff, whichever is applicable.
8. Slopes for disturbed areas must be identified in the SWPPP. A site map or maps defining the sloped areas for all phases of the project must be included in the SWPPP. The disturbance of steep slopes shall be minimized.
9. Manage stockpiles or land clearing debris piles composed, in whole or in part, of sediment and/or soil.
- (a) Locate the piles outside of any natural buffers zones, established under the condition above, and away from any stormwater conveyances, drain inlets, and areas where stormwater flow is concentrated;
  - (b) Install a sediment barrier along all downgradient perimeter areas;
  - (c) Divert surface flows around stockpiles to reduce and minimize erosion of the stockpile.

- (d) For piles that will be unused for 14 or more days, provide cover with appropriate temporary stabilization in accordance with Part V. BMP REQUIREMENTS, Condition 13.
  - (e) Rinsing, sweeping, or otherwise placing any soil, sediment, debris, or stockpiled product which has accumulated on pavement or other impervious surfaces into any stormwater conveyance, storm drain inlet, or water of the state is prohibited.
10. The site shall include BMPs for pollution prevention measures and shall be noted in the SWPPP. At minimum such measures must be designed, installed, implemented, and maintained to:
- (a) Minimize the discharge of pollutants from equipment and vehicle rinsing; no detergents, additives, or soaps of any kind shall be discharged. Rinse waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
  - (b) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials present on the site to precipitation and to stormwater;
  - (c) Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures, including, but not limited to, the installation of containment berms and use of drip pans at petroleum product and liquid storage tanks and containers; and
  - (d) Prevent discharges from causing or contributing to an exceedance of water quality standards including general criteria.
11. Sedimentation Basins: The SWPPP shall include a sedimentation basin for each drainage area with ten or more acres disturbed at one time.
- (a) The sedimentation basin shall be sized, at a minimum, to treat a local 2-year, 24-hour storm.
  - (b) Sediment basins shall not be constructed in any waters of the state or natural buffer zones.
  - (c) Discharges from dewatering activities shall be managed by appropriate controls. The SWPPP shall include a description of any anticipated dewatering methods and specific BMPs designed to treat dewatering water.
    - 1) Appropriate controls include, but are not limited to, sediment socks, dewatering tanks, tube settlers, weir tanks, filtration systems (e.g. bag or sand filters), and passive treatment systems that are designed to remove or retain sediment.
    - 2) Erosion controls and velocity dissipation devices (e.g., check dams, riprap, and vegetated buffers) to minimize erosion at inlets, outlets, and discharge points from shall be utilized.
    - 3) Water with an oil sheen shall not be discharged and shall be marked in SWPPP.
    - 4) Visible floating solids and foam shall not be discharged.
  - (d) Until final stabilization has been achieved, sediment basins and impoundments shall utilize outlet structures or floating skimmers that withdraw water from the surface when discharging.
    - 1) Under frozen conditions, it may be considered infeasible to withdraw water from the surface and an exception can be made for that specific period as long as discharges that may contain sediment and other pollutants are managed by appropriate controls. If determined infeasible due to frozen conditions, documentation must be provided in the SWPPP to support the determination, including the specific conditions or time period when this exception applies.
  - (e) Accumulated sediment shall not exceed 50% of total volume or as prescribed in the design, whichever is less. Note in the SWPPP the locations for disposal of the material removed from sediment basins.
  - (f) Prevent discharges to the receiving stream causing excessive visual turbidity. For the purposes of this permit, visual turbidity refers to a sediment plume or other cloudiness in the water caused by sediment that can be identified by an observer.
  - (g) The SWPPP shall require the basin be maintained until final stabilization of the disturbed area served by the basin.

Where use of a sediment basin is infeasible, the SWPPP shall evaluate and specify other similarly effective BMPs to be employed to control erosion and sediment. These similarly effective BMPs shall be selected from appropriate BMP guidance documents authorized by this permit. The BMPs must provide equivalent water quality protection to achieve compliance with this permit. The SWPPP shall require both temporary and permanent sedimentation basins to have a stabilized spillway to minimize the potential for erosion of the spillway or basin embankment.

12. Soil disturbing activities on site that have ceased either temporarily or permanently shall initiate stabilization immediately in accordance with the options below. For soil disturbing activities that have been temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days:
  - (a) The permittee shall construct BMPs to establish interim stabilization; and
  - (b) Stabilization must be initiated immediately and completed within 14 calendar days.
  - (c) For soil disturbing activities that have been permanently ceased on any portion of the site, final stabilization of disturbed areas must be initiated immediately and completed within 14 calendar days.
    - 1) Allowances to the 14-day completion period for temporary and final stabilization may be made due to weather and equipment malfunctions. The use of allowances shall be documented in the SWPPP. Allowances may be determined unnecessary after review by the Department.
  - (d) Until stabilization is complete, interim sediment control shall consist of well-established and maintained BMPs that are reasonably certain to protect waters of the state from sediment pollution over an extended period of time. This may require adding more BMPs to an area than is normally used during daily operations. The types of BMPs used must be suited to the area disturbed, taking into account the number of acres exposed and the steepness of the slopes. If the slope of the area is greater than 3:1 (three feet horizontal to one foot vertical), then the permittee shall establish interim stabilization within seven days of ceasing operations on that part of the site. The following activities would constitute the immediate initiation of stabilization:
    - 1) Prepping the soil for vegetative or non-vegetative stabilization as long as seeding, planting, and/or installation of non-vegetative stabilization products takes place as soon as practicable;
    - 2) Applying mulch or other non-vegetative product to the exposed areas;
    - 3) Seeding or planting the exposed areas;
    - 4) Finalizing arrangements to have stabilization product fully installed in compliance with the deadlines for completing stabilization.
  - (e) If vegetative stabilization measures are being implemented, stabilization is considered “installed” when all activities necessary to seed or plant the area are completed. Installed does not mean established.
  - (f) If non-vegetative stabilization measures are being implemented, stabilization is considered “installed” when all such measures are implemented or applied.
    - 1) Non-vegetative stabilization shall prevent erosion and shall be chosen for site conditions, such as slope and flow of stormwater.
  - (g) Final stabilization is not considered achieved until vegetation has grown and established to meet the requirements below.
13. Prior to removal of BMPs, ceasing site inspections, and removing from the quarterly report, final stabilization must be achieved. Final stabilization shall be achieved as soon as possible once land disturbance activities have ceased. Document in the SWPPP the type of stabilization and the date final stabilization is achieved.
  - (a) The project is considered to have achieved final stabilization when perennial vegetation (excluding volunteer vegetation), pavement, buildings, or structures using permanent materials (e.g., riprap, gravel, etc.) cover all areas that have been disturbed. With respect to areas that have been vegetated, vegetation must be at least 70% coverage of 100% of the vegetated areas on site. Vegetation must be evenly distributed.
  - (b) Disturbed areas on agricultural land are considered to have achieved final stabilization when they are restored to their preconstruction agricultural use. If former agricultural land is changing to non-agricultural use, this is no longer considered agricultural land and shall follow condition (a).
  - (c) If the intended function of a specific area of the site necessitates that it remain disturbed, final stabilization is considered achieved if all of the following are met:
    - 1) Only the minimum area needed remains disturbed (i.e., dirt access roads, motocross tracks, utility pole pads, areas being used for storage of vehicles, equipment, materials). Other areas must meet the criteria above.

- 2) Permanent structural BMPs (e.g., rock checks, berms, grading, etc.) or non-vegetative stabilization measures are implemented and designed to prevent sediment and other pollutants from entering waters of the state.
- 3) Inspection requirements in Part IV. SWPPP MANAGEMENT REQUIREMENT, Condition 11 are met and documented in the SWPPP.
- (d) Winter weather and frozen conditions do not excuse any of the above final stabilization requirements. If vegetation is required for stabilization the permittee must maintain BMPs throughout winter weather and frozen conditions until thawing and vegetation meets final stabilization criteria above. Document stabilization attempts during frozen conditions in the SWPPP. Consider future freezing when removing vegetation and plan with temporary stabilization techniques before the ground becomes frozen.

## **VI. SITE FINALIZATION & PERMIT TERMINATION**

1. Until a site is finalized, the permittee must comply with all conditions in the permit, including continuation of site inspections and reporting quarterly to the Department. To finalize the site and remove from this permit coverage, the site shall meet the following requirements:
  - (a) For any areas that (1) were disturbed during construction, (2) are not covered over by permanent structures, and (3) over which the permittee had control during the construction activities, the requirements for final vegetative or non-vegetative stabilization in Part V. BMP REQUIREMENTS, Condition 13;
  - (b) The permittee has removed and properly disposed of all construction materials, waste, and waste handling devices and has removed all equipment and vehicles that were used during construction, unless intended for long-term beyond construction phase;
  - (c) The permittee has removed all temporary BMPs that were installed and maintained during construction, except those that are intended for long-term use or those that are biodegradable; and
  - (d) The permittee has removed all potential pollutants and pollutant-generating activities associated with construction, unless needed for long-term use following the construction activities.
2. The permit may be terminated if;
  - (a) There has been a transfer of control of all areas of the site for which the current permittee is responsible under this permit to another operator, and that operator has obtained coverage under this permit;
  - (b) Active sites obtain coverage under an individual or alternative general NPDES permit, with land disturbance conditions; or
  - (c) This permit may be terminated when all projects covered under this permit are finalized. In order to terminate the permit, the permittee shall notify the Department by submitting a Request for Termination along with the final quarterly report for the current calendar quarter.

## **VII. REPORTING AND SAMPLING REQUIREMENTS**

1. The permittee is not required to sample stormwater under this permit. The Department may require sampling and reporting as a result of illegal discharges, compliance issues related to water quality concerns, or evidence of off-site impacts from activities at a site. If such an action is needed, the Department will specify in writing the sampling requirements, including such information as location and extent. If the permittee refuses to perform sampling when required, the Department may terminate the general permit and require the facility to obtain a site-specific permit with sampling requirements.
2. Electronic Discharge Monitoring Report (eDMR) Submission System. The NPDES Electronic Reporting Rule, 40 CFR Part 127, reporting of any report required by the permit shall be submitted via an electronic system to ensure timely, complete, accurate, and nationally consistent set of data for the NPDES program. The eDMR system is currently the only Department-approved reporting method for this permit unless specified elsewhere in this permit, or a waiver is granted by the Department. The facility must register in the Department's eDMR system through the Missouri Gateway for Environmental Management (MoGEM) before the first report is due.
3. Permittees shall prepare a quarterly report with a list of active land disturbance sites including any off-site borrow or depositional areas associated with the construction project and submit the following information electronically as an

attachment to the eDMR system until such a time when the current or a new system is available to allow direct input of the data:

- (a) The name of the project;
- (b) The location of the project (including the county);
- (c) The name of the primary receiving water(s) for each project;
- (d) A description of the project;
- (e) The number of acres disturbed;
- (f) The percent of completion of the project; and
- (g) The projected date of completion.

The quarterly report(s) shall be maintained by the permittee and readily available for review by the Department at the address provided on the application as well as submitted quarterly via the Department's eDMR system. The permittee shall submit quarterly reports according to Table A.

<b>Table A</b>		<b>Schedule for Quarterly Reporting</b>	
Activity for the months of:		Report is due:	
January, February, March (1st Quarter)		April 28	
April, May, June (2nd Quarter)		July 28	
July, August, September (3rd Quarter)		October 28	
October, November, December (4th Quarter)		January 28	

### **VIII. STANDARD PERMIT CONDITIONS**

1. Records: The permittee shall retain copies of this general permit, the SWPPP and all amendments for the site named in the State Operating Permit, results of any monitoring and analysis, and all site inspection records required by this general permit.
  - (a) The records shall be accessible during normal business hours and retained for a period of at least three (3) years from the date of termination.
  - (b) The permittee shall provide a copy (electronic or otherwise) of the SWPPP to the Department, USEPA, or any local agency or government representative if they request a copy in the performance of their official duties within 24 hours of the request (or next working day), unless given more time by the representative.
  - (c) The permittee shall provide a copy of the SWPPP to those who are responsible for installation, operation, or maintenance of any BMP. The permittee, their representative, and/or the contractor(s) responsible for installation, operation and maintenance of the BMPs shall have a current copy of the SWPPP with them when on the project site.
  
2. Land Ownership and Change of Ownership: Federal and Missouri stormwater regulations [10 CSR 20-6.200(1) (B)] require a stormwater permit and erosion control measures for all land disturbances of one or more acres. These regulations also require a permit for less than one acre lots if the lot is part of a larger common plan of development or sale where that plan is at least one acre in size.
  - (a) If the permittee sells any portion of a permitted site to a developer for commercial, industrial, or residential use, this land remains a part of the common sale and the new owner must obtain a permit prior to conducting any land disturbance activity. Therefore, the original permittee must amend the SWPPP to show that the property has been sold and, therefore, no longer under the original permit coverage.
  - (b) Property of any size which is part of a larger common plan of development where the property has achieved final stabilization and the original permit terminated will require application of a new land disturbance permit for any future land disturbance activity unless the activity is by an individual residential building lot owner on a site less than one acre.
  - (c) If a portion of a larger common plan of development is sold to an individual for the purpose of building his or her own private residence, a permit is required if the portion of land sold is equal to or greater than one acre. No permit is required, however, for less than one acre of land sold.
  
3. Permit Transfer: This permit may not be transferred to a new owner.



4. Termination: This permit may be terminated when the project has achieved final stabilization, defined in Part VI. SITE FINALIZATION & PERMIT TERMINATION.
  - (a) In order to terminate the permit, the permittee shall notify the Department by submitting the form Request for Termination of Operating Permit Form MO 780-2814. The form should be submitted to the appropriate regional office or through an approved electronic system if it should become available.
  - (b) The Cover Page (Certificate Page) of the Master General Permit for Land Disturbance specifies the “effective date” and the “expiration date” of the Master General Permit. The “issued date” along with the “expiration date” will appear on the State Operating Permit issued to the applicant. **This permit does not continue administratively beyond the expiration date.**
5. Duty to Reapply: If the project or development completion date will be after the expiration date of this general permit, then the permittee must reapply to the Department for a new permit. This permit may be applied for and issued electronically in accordance with Section 644.051.10, RSMo.
  - (a) Due to the nature of the electronic permitting system, a period of time may be granted at the discretion of the Department in order to apply for a new permit after the new version is effective. Applicants must maintain appropriate best management practices and inspections during the discretionary period.
6. Duty to Comply: The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Missouri Clean Water Law and Federal Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.
7. Modification, Revocation, and Reopening:
  - (a) If at any time the Department determines that the quality of waters of the state may be better protected by reopening this permit, or revoking this permit and requiring the owner/operator of the permitted site to apply for a site-specific permit, the Department may revoke a general permit and require any person to obtain such an operating permit as authorized by 10 CSR20-6.010(13) and 10 CSR 20-6.200(1)(B).
  - (b) If this permit is reopened, modified, or revoked pursuant to this Section, the permittee retains all rights under Chapter 536 and 644 Revised Statutes of Missouri upon the Department’s reissuance of the permit as well as all other forms of administrative, judicial, and equitable relief available under law.
8. Other Information: Where the permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.
9. Duty to Provide Information: The permittee shall furnish to the Department, within 24 hours unless explicitly granted more time in writing, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Department upon request, copies of records required to be kept by this permit.
10. Inspection and Entry: The permittee shall allow the Department, or an authorized representative (including an authorized contractor acting as a representative of the Department), upon presentation of credentials and other documents as may be required by law, to:
  - (a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of the permit;
  - (b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
  - (c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
  - (d) Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Federal Clean Water Act or Missouri Clean Water Law, any substances or parameters at any location.

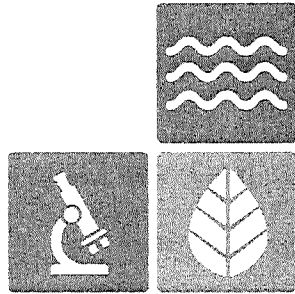
11. Signatory Requirement:

- (a) All permit applications, reports required by the permit, or information requested by the Department shall be signed and certified. (See 40 CFR 122.22 and 10 CSR 20-6.010)
- (b) The Federal Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit (including monitoring reports or reports of compliance or non-compliance) shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six (6) months per violation, or by both.
- (c) The Missouri Clean Water Law provides that any person who knowingly makes any false statement, representation or certification in any application, record, report, plan, or other document filed or required to be maintained pursuant to sections 644.006 to 644.141 shall, upon conviction, be punished by a fine of not more than ten thousand dollars, or by imprisonment for not more than six months, or by both.

12. Property Rights: This permit does not convey any property rights of any sort or any exclusive privilege.

13. Notice of Right to Appeal: If you were adversely affected by this decision, you may be entitled to pursue an appeal before the administrative hearing commission (AHC) pursuant to Sections 621.250 and 644.051.6 RSMo. To appeal, you must file a petition with the AHC within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Any appeal should be directed to:

Administrative Hearing Commission  
U.S. Post Office Building, Third Floor  
131 West High Street, P.O. Box 1557  
Jefferson City, MO 65102-1557  
Phone: 573-751-2422  
Fax: 573-751-5018  
Website: <https://ahc.mo.gov>



**MISSOURI**  
DEPARTMENT OF  
NATURAL RESOURCES

STORMWATER DISCHARGES FROM  
THIS LAND DISTURBANCE SITE ARE  
AUTHORIZED BY THE MISSOURI  
STATE OPERATING PERMIT NUMBER:

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ANYONE WITH QUESTIONS OR  
CONCERNS ABOUT STORMWATER  
DISCHARGES FROM THIS SITE,  
PLEASE CONTACT THE MISSOURI  
DEPARTMENT OF NATURAL  
RESOURCES AT

**1-800-361-4827**

**MISSOURI DEPARTMENT OF NATURAL RESOURCES**  
**FACT SHEET FOR MASTER GENERAL PERMIT**  
**MO-R100xxx**

The Federal Water Pollution Control Act [Clean Water Act (CWA)] Section 402 of Public Law 92-500 (as amended) established the National Pollution Discharge Elimination System (NPDES) permit program. This program regulates the discharge of pollutants from point sources into the waters of the United States and the release of stormwater from certain point sources. All such discharges are unlawful without a permit (Section 301 of the CWA). After a permit is obtained, a discharge not in compliance with all permit terms and conditions is unlawful. Missouri State Operating Permits (MSOPs) are issued by the Missouri Department of Natural Resources (Department) under an approved program operated in accordance with federal and state laws (Federal CWA and Missouri Clean Water Law Section 644 as amended). Permits are issued for a period of five (5) years unless otherwise specified.

Per 40 CFR 124.56, 40 CFR 124.8, and 10 CSR 20-6.020(1)(A)2, a Fact Sheet shall be prepared to give pertinent information regarding the applicable regulations, rationale for the development of effluent limitations and conditions, and the public participation process for the permit. A Fact Sheet is not an enforceable part of an MSOP.

**DEFINITIONS FOR THE PURPOSES OF THIS PERMIT:**

Common Promotional Plan: A plan undertaken by one (1) or more persons to offer lots for sale or lease; where land is offered for sale by a person or group of persons acting in concert, and the land is contiguous or is known, designated, or advertised as a common unit or by a common name or similar names, the land is presumed, without regard to the number of lots covered by each individual offering, as being offered for sale or lease as part of a common promotional plan.

Dewatering: The act of draining rainwater and/or groundwater from basins, building foundations, vaults, and trenches.

Effective Operating Condition: For the purposes of this permit, a stormwater control is kept in effective operating condition if it has been implemented and maintained in such a manner that it is working as designed to minimize pollutant discharges.

Emergency-Related Project: A project initiated in response to a public emergency (e.g. earthquakes, extreme flooding conditions, tornado, disruptions in essential public services, pandemic) for which the related work requires immediate authorization to avoid imminent endangerment to human health/safety or the environment or to reestablish essential public services.

Exposed Soils: For the purposes of this permit, soils that as a result of earth-disturbing activities are left open to the elements.

Immediately: For the purposes of this permit, immediately should be defined as within 24 hours.

Impervious Surface: For the purpose of this permit, any land surface with a low or no capacity for soil infiltration including, but not limited to, pavement, sidewalks, parking areas and driveways, packed gravel or soil, or rooftops.

Infeasible: Infeasible means not technologically possible or not economically practicable and achievable in light of best industry practices.

Install or Installation: When used in connection with stormwater controls, to connect or set in position stormwater controls to make them operational.

Land Disturbance Site or Site: The land or water area where land disturbance activities will occur and where stormwater controls will be installed and maintained. The land disturbance site includes construction support activities, which may be located at a different part of the property from where the primary land disturbance activity will take place or on a different piece of property altogether. Off-site borrow areas directly and exclusively related to the land disturbance activity are part of the site and must be permitted.

Larger Common Plan of Development or Sale: A continuous area where multiple separate and distinct construction activities are occurring under one plan, including any off-site borrow areas that are directly and exclusively related to the land disturbance activity. Off-site borrow areas utilized for multiple different land disturbance projects are considered their own entity and are not part of the larger common plan of development or sale. See definition of Common Promotional Plan to understand what a 'common plan' is.

Minimize: To reduce and/or eliminate to the extent achievable using stormwater controls that are technologically available and economically practicable and achievable in light of best industry practices.

Non-structural Best Management Practices (BMPs): Institutional, educational, or pollution prevention practices designed to limit the amount of stormwater runoff or pollutants that are generated in the landscape. Examples of non-structural BMPs include picking up trash and debris, sweeping up nearby sidewalks and streets, maintaining equipment, and training site staff on stormwater control practices.

Operational: for the purposes of this permit, stormwater controls are made "operational" when they have been installed and implemented, are functioning as designed, and are properly maintained.

Ordinary High Water Mark: The line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, and/or the presence of litter and debris.

Peripheral: For the purposes of this permit, peripheral should be defined as the outermost boundary of the area that will be disturbed.

Permanently: For the purposes of this permit, permanently is defined as any activity that has been ceased without any intentions of future disturbance.

Pollution Prevention Controls (or Measures): Stormwater controls designed to reduce or eliminate the addition of pollutants to construction site discharges through analysis of pollutant sources, implementation of proper handling/disposal practices, employee education, and other actions.

Qualified Person (inspections): A person knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention who possesses the appropriate skills and training to assess conditions at the construction site that could impact stormwater quality and the appropriate skills and training to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.

Stormwater Control (also referred to as sediment/erosion controls): refers to any temporary or permanent BMP or other method used to prevent or reduce the discharge of pollutants to waters of the state.

Structural BMP: Physical sediment/erosion controls working individually or as a group (treatment train) appropriate to the source, location, and area climate for the pollutant to be controlled. Examples of structural BMPs include silt fences, sedimentation ponds, erosion control blankets, and seeding.

Temporary Stabilization: A condition where exposed soils or disturbed areas are provided temporary vegetation and/or non-vegetative protective cover to prevent erosion and sediment loss. Temporary stabilization may include temporary seeding, geotextiles, mulches, and other techniques to reduce or eliminate erosion until either final stabilization can be achieved or until further construction activities take place to re-disturb this area.

Treatment Train: A multi-BMP approach to managing the stormwater volume and velocity and often includes erosion prevention and sediment control practices often applied when the use of a single BMP is inadequate in preventing the erosion and transport of sediment. A good option to utilize as a corrective action.

Volunteer Vegetation: A volunteer plant is a plant that grows on its own, rather than being deliberately planted for stabilization purposes. Volunteers often grow from seeds that float in on the wind, are dropped by birds, or are inadvertently mixed into soils. Commonly, volunteer vegetation is referred to as ‘weeds’. This does not meet the requirements for final stabilization.

Waters of the State: Section 644.016.1(27) RSMo. defines waters of the state as, “All waters within the jurisdiction of this state, including all rivers, streams, lakes and other bodies of surface and subsurface water lying within or forming a part of the boundaries of the state which are not entirely confined and located completely upon lands owned, leased or otherwise controlled by a single person or by two or more persons jointly or as tenants in common.”

## **PART I – BASIC PERMIT INFORMATION**

Facility Type: Industrial Stormwater; Land Disturbance  
Facility SIC Code(s): 1629  
Facility Description: Construction or land disturbance activity (e.g., clearing, grubbing, excavating, grading, filling, and other activities that result in the destruction of the root zone and/or land disturbance activity that is reasonably certain to cause pollution to waters of the state).

This permit establishes a Stormwater Pollution Prevention Plan (SWPPP) requirement for pollutants of concern from this type of facility or for all facilities and sites covered under this permit. 10 CSR 20-6.200(7) specifies “general permits shall contain BMP requirements and/or monitoring and reporting requirements to keep the stormwater from becoming contaminated”.

Land disturbance activities include clearing, grubbing, excavating, grading, filling and other activities that result in the destruction of the root zone and/or other activities that are reasonably certain to cause pollution to waters of the state. A Missouri State Operating Permit for land disturbance permit is required for construction disturbance activities of one or more acres or for construction activities that disturb less than one acre when they are part of a larger common plan of development or sale that will disturb a cumulative total of one or more acres over the life of the project.

The primary requirement of a land disturbance permit is the development of a SWPPP which incorporates site-specific BMPs to minimize soil exposure, soil erosion, and the discharge of pollutants. The SWPPP ensures the design, implementation, management, and maintenance of BMPs in order to prevent sediment and other pollutants from leaving the site.

When it precipitates, stormwater washes over the loose soil on a construction site and various other materials and products being stored outside. As stormwater flows over the site, it can pick up pollutants like sediment, debris, and chemicals from the loose soil and transport them to nearby storm sewer systems or directly into rivers, lakes, or coastal waters.

The Missouri Department of Natural Resources is responsible for ensuring that construction site operators have the proper stormwater controls in place so that construction can proceed in a way that protects your community's clean water and the surrounding environment. One way the department helps protect water quality is by issuing land disturbance permits.

Local conditions are not considered when developing conditions for a general permit. A facility may apply for a site-specific permit if they desire a review of site-specific conditions.

## **PART II – RECEIVING STREAM INFORMATION**

### **APPLICABLE DESIGNATIONS OF WATERS OF THE STATE:**

Per Missouri Effluent Regulations (10 CSR 20-7.015), the waters of the state are divided into seven (7) categories. This permit applies to facilities discharging to the following water body categories:

- ✓ Missouri or Mississippi River [10 CSR 20-7.015(2)]
- ✓ Lakes or Reservoirs [10 CSR 20-7.015(3)]
- ✓ Losing Streams [10 CSR 20-7.015(4)]
- ✓ Metropolitan No-Discharge Streams [10 CSR 20-7.015(5)]
- ✓ Special Streams [10 CSR 20-7.015(6)]
- ✓ Subsurface Waters [10 CSR 20-7.015(7)]
- ✓ All Other Waters [10 CSR 20-7.015(8)]

Missouri Water Quality Standards (10 CSR 20-7.031) defines the Clean Water Commission water quality objectives in terms of "water uses to be maintained and the criteria to protect those uses." The receiving stream and/or 1<sup>st</sup> classified receiving stream's designated water uses shall be maintained in accordance with 10 CSR 20-7.031(24). A general permit does not take into consideration site-specific conditions.

### **MIXING CONSIDERATIONS:**

This permit applies to receiving streams of varying low flow conditions. Therefore, the effluent limitations must be based on the smallest low flow streams considered, which includes waters without designated uses. As such, no mixing is allowed [10 CSR 20-7.031(5)(A)4.B.(I)(a)]. No Zone of Initial Dilution is allowed. [10 CSR 20-7.031(5)(A)4.B.(I)(b)].

### **RECEIVING STREAM MONITORING REQUIREMENTS:**

There are no receiving water monitoring requirements recommended at this time.

## **PART III – RATIONALE AND DERIVATION OF EFFLUENT LIMITATIONS & PERMIT CONDITIONS**

### **305(B) REPORT, 303(d) LIST, & TOTAL MAXIMUM DAILY LOAD (TMDL):**

Section 305(b) of the Federal CWA requires each state identify waters not meeting Water Quality Standards and for which adequate water pollution controls have not been required. Water Quality Standards protect such beneficial uses of water as whole body contact, maintaining fish and other aquatic life, and providing drinking water for people, livestock, and wildlife. The 303(d) list helps state and federal agencies keep track of waters which are impaired but not addressed by normal water pollution control programs.

A TMDL is a calculation of the maximum amount of a given pollutant a body of water can absorb before its water quality is affected. If a water body is determined to be impaired as listed on the 303(d) list, then a watershed management plan will be developed which shall include the TMDL calculation. For facilities with an existing general permit before a TMDL is written on their receiving stream, the Department will evaluate the permit and may require any facility authorized by this general permit to apply for and obtain a site-specific operating permit.

**ANTI-BACKSLIDING:**

A provision in the Federal Regulations [CWA Section 303(d)(4); CWA Section 402(c); 40 CFR Part 122.44(I)] requires a reissued permit to be as stringent as the previous permit with some exceptions.

- ✓ Not Applicable: All effluent limitations in this permit are at least as protective as those previously established.

**ANTIDEGRADATION:**

Antidegradation policies ensure protection of water quality for a particular water body on a pollutant by pollutant basis to ensure Water Quality Standards are maintained to support beneficial uses such as fish and wildlife propagation and recreation on and in the water. This also includes special protection of waters designated as an Outstanding National Resource Water or Outstanding State Resource Water [10 CSR 20-7.031(3)(C)]. Antidegradation policies are adopted to minimize adverse effects on water.

The Department has determined the best avenue forward for implementing the Antidegradation requirements into general stormwater permits is by requiring the appropriate development and maintenance of a SWPPP. The SWPPP must identify all reasonable and effective BMPs, taking into account environmental impacts and costs. This analysis must document why no discharge or no exposure options are not feasible at the facility. This selection and documentation of appropriate control measures will then serve as the analysis of alternatives and fulfill the requirements of the Antidegradation Rule and Implementation Procedure 10 CSR 20-7.031(3) and 10 CSR 20-7.015(9)(A)5.

Any facility seeking coverage under this permit which undergoes expansion or discharges a new pollutant of concern must update their SWPPP and select reasonable and cost effective new BMPs. New facilities seeking coverage under this permit are required to develop a SWPPP including this analysis and documentation of appropriate BMPs. Renewal of coverage for a facility requires a review of the SWPPP to ensure the selected BMPs continue to be appropriate.

- ✓ Applicable; the facility must review and maintain stormwater BMPs as appropriate.

**BENCHMARKS:**

When a permitted feature or outfall consists of only stormwater, a benchmark may be implemented at the discretion of the permit writer. Benchmarks require the facility to monitor and, if necessary, replace and update stormwater control measures. Benchmark concentrations are not effluent limitations. A benchmark exceedance, therefore, is not a permit violation; however, failure to take corrective action is a violation of the permit. Benchmark monitoring data is used to determine the overall effectiveness of control measures and to assist the permittee in knowing when additional corrective actions may be necessary to comply with the limitations of the permit.

- ✓ Not applicable; this permit does not contain numeric benchmarks.

**BEST MANAGEMENT PRACTICES (BMPs):**

Minimum site-wide BMPs are established in this permit to ensure all permittees are managing their sites equally to protect waters of the state from certain activities which could cause negative effects in receiving water bodies. While not all sites require a SWPPP because the SIC codes are specifically exempted in 40 CFR 122.26(b)(14), these BMPs are not specifically included for stormwater purposes. These practices are minimum requirements for all industrial sites to protect waters of the state. If the minimum BMPs are not followed, the facility may violate general criteria [10 CSR 20-7.031(4)]. Statutes are applicable to all permitted facilities in the state; therefore, pollutants cannot be released unless in accordance with RSMo 644.011 and 644.016 (17).

**CHANGES IN DISCHARGES OF TOXIC POLLUTANT:**

This special condition reiterates the federal rules found in 40 CFR 122.44(f) and 122.42(a)(1). In these rules, the facility is required to report changes in amounts of toxic substances discharged. Toxic substances are defined in 40 CFR 122.2 as "...any pollutant listed as toxic under section 307(a)(1) or, in the case of "sludge use or disposal practices," any pollutant identified in regulations implementing section 405(d) of the CWA." Section 307 of the CWA then refers to those parameters found in 40 CFR 401.15.



The permittee should also consider any other toxic pollutant in the discharge as reportable under this condition.

**EFFLUENT LIMITATION GUIDELINE:**

Effluent Limitation Guidelines, or ELGs, are found at 40 CFR 400-499. These are limitations established by the EPA based on the SIC code and the type of work a facility is conducting. Most ELGs are for process wastewater and some address stormwater. All are technology based limitations which must be met by the applicable facility at all times.

- ✓ The industries covered under this permit have an associated Effluent Limit Guideline (ELG) which is applicable to the stormwater discharges in this permit and is applied under 40 CFR 125.3(a).

**ELECTRONIC DISCHARGE MONITORING REPORT (EDMR) SUBMISSION SYSTEM:**

The U.S. Environmental Protection Agency (EPA) promulgated a final rule on October 22, 2015, to modernize CWA reporting for municipalities, industries, and other facilities by converting to an electronic data reporting system. The final rule requires regulated entities and state and federal regulators to use information technology to electronically report data required by the National Pollutant Discharge Elimination System (NPDES) permit program instead of filing paper reports. To comply with the federal rule, the Department is requiring all permittees to begin submitting discharge monitoring data and reports online.

- ✓ Applicable; this permit requires quarterly reports.

**GENERAL CRITERIA CONSIDERATIONS:**

In accordance with 40 CFR 122.44(d)(1), effluent limitations shall be placed into permits for pollutants determined to cause, have reasonable potential to cause, or to contribute to, an excursion above any water quality standard, including narrative water quality criteria. In order to comply with this regulation, the permit writer has completed a reasonable potential determination on whether discharges have reasonable potential to cause or contribute to an excursion of the general criteria listed in 10 CSR 20-7.031(4). In instances where reasonable potential exists, the permit includes limitations within the permit to address the reasonable potential. In discharges where reasonable potential does not exist, the permit may include monitoring to later determine the discharge's potential to impact the narrative criteria. Additionally, RSMo 644.076.1, as well as Standard Permit Conditions Part VIII of this permit state it shall be unlawful for any person to cause or allow any discharge of water contaminants from any water contaminant or point source located in Missouri in violation of sections 644.006 to 644.141 of the Missouri Clean Water Law or any standard, rule, or regulation promulgated by the commission.

**LAND APPLICATION:**

Land application, or surficial dispersion of wastewater and/or sludge, is performed by facilities to maintain a basin as no-discharge. Requirements for these types of operations are found in 10 CSR 20-6.015; authority to regulate these activities is from RSMo 644.026.

- ✓ Not applicable; this permit does not authorize operation of a surficial land application system to disperse wastewater or sludge.

**LAND DISTURBANCE:**

Land disturbance, sometimes called construction activities, are actions which cause disturbance of the root layer or soil; these include clearing, grading, and excavating of the land. 40 CFR 122.26(b)(14) and 10 CSR 20-6.200(3) requires permit coverage for these activities. Coverage is not required for facilities when only providing maintenance of original line and grade, hydraulic capacity, or to continue the original purpose of the facility.

- ✓ Applicable; this permit provides coverage for land disturbance activities. These activities have SWPPP requirements and may be combined with the standard site SWPPP. Land disturbance BMPs should be designed to control the expected peak discharges. The University of Missouri has design storm events for the 25 year 24 hour storm; these can be found at: [http://ag3.agebb.missouri.edu/design\\_storm/comparison\\_reports/20191117\\_25yr\\_24hr\\_comparison\\_table.htm](http://ag3.agebb.missouri.edu/design_storm/comparison_reports/20191117_25yr_24hr_comparison_table.htm); to calculate peak discharges, the website <https://www.lmnoeng.com/Hydrology/rational.php> has the rational equation to calculate expected discharge volume from the peak storm events.

**NUTRIENT MONITORING:**

Nutrient monitoring is required for facilities characteristically or expected to discharge nutrients (nitrogenous compounds and/or phosphorus) when the design flow is equal to or greater than 0.1 MGD per 10 CSR 20-7.015(9)(D)8.

- ✓ This is a stormwater only permit; therefore, it is not subject to provisions found in 10 CSR 20-7.015 per 10 CSR 20-7.015(1)(C).

**OIL/WATER SEPARATORS:**

Oil water separator (OWS) tank systems are frequently found at industrial sites where process water and stormwater may contain oils and greases, oily wastewaters, or other immiscible liquids requiring separation. Food industry discharges typically require pretreatment prior to discharge to municipally owned treatment works. Per 10 CSR 26-2.010(2)(B), all oil water separator tanks must be operated according to manufacturer's specifications and authorized in NPDES permits per 10 CSR 26-2.010(2) or may be regulated as a petroleum tank.

- ✓ Not applicable; this permit does not authorize the operation of OWS. The facility must obtain a separate permit to cover operation of and discharge from these devices.

**PERMIT SHIELD:**

The permit shield provision of the CWA (Section 402(k)) and Missouri Clean Water Law (644.051.16 RSMo) provides that when a permit holder is in compliance with its NPDES permit or MSOP, they are effectively in compliance with certain sections of the CWA and equivalent sections of the Missouri Clean Water Law. In general, the permit shield is a legal defense against certain enforcement actions but is only available when the facility is in compliance with its permit and satisfies other specific conditions, including having completely disclosed all discharges and all facility processes and activities to the Department at time of application. It is the facility's responsibility to ensure that all potential pollutants, waste streams, discharges, and activities, as well as wastewater land application, storage, and treatment areas, are all fully disclosed to the Department at the time of application or during the draft permit review process. Subsequent requests for authorization to discharge additional pollutants or expanded or newly disclosed flows, or for authorization for previously unpermitted and undisclosed activities or discharges, will likely require permit modification or may require the facility be covered under a site specific permit.

**PRETREATMENT PROGRAM:**

This permit does not regulate pretreatment requirements for facilities discharging to an accepting permitted wastewater treatment facility. If applicable, the receiving entity (the publicly owned treatment works - POTW) must ensure compliance with any effluent limitation guidelines for pretreatment listed in 40 CFR Subchapter N per 10 CSR 20-6.100. Pretreatment regulations per RSMo 644.016 are limitations on the introduction of pollutants or water contaminants into publicly owned treatment works or facilities.

- ✓ Not Applicable; the facilities covered under this permit are not required to meet pretreatment requirements under an ELG.

**PUBLIC NOTICE OF COVERAGE FOR AN INDIVIDUAL FACILITY:**

Public Notice of reissuance of coverage is not required unless the facility is a specific type of facility as defined in 10 CSR 20-6.200(1). The need for an individual public notification process shall be determined and identified in the permit [10 CSR 20-6.020(1)(C)5.].

- ✓ Not applicable; public notice is not required for coverage under this permit to individual facilities. The MGP is public noticed in lieu of individual permit PN requirements.

**REASONABLE POTENTIAL ANALYSIS (RPA):**

Federal regulation 40 CFR Part 122.44(d)(1)(i) requires effluent limitations for all pollutants which are or may be discharged at a level which will cause or have the reasonable potential to cause or contribute to an in-stream excursion above narrative or numeric water quality standard. In accordance with 40 CFR Part 122.44(d)(iii) if the permit writer determines any given pollutant has the reasonable potential to cause or contribute to an in-stream excursion above the water quality standard, the permit must contain effluent limits for the pollutant.

- ✓ The permit writer reviewed industry materials, available past inspections, and other documents and research to evaluate general and narrative water quality reasonable potential for this permit. Permit writers also use the Department's permit writer's manual, the EPA's permit writer's manual (<https://www.epa.gov/npdes/npdes-permit-writers-manual>), program policies, and best professional judgment. For each parameter in each permit, the permit writer carefully considers all applicable information regarding technology based effluent limitations, effluent limitation guidelines, and water quality standards. Best professional judgment is based on the experience of the permit writer, cohorts in the Department and resources at the EPA, research, and maintaining continuity of permits if necessary. For stormwater permits, the permit writer is required per 10 CSR 6.200(6)(B)2 to consider: A. application and other information supplied by the permittee; B. effluent guidelines; C. best professional judgment of the permit writer; D. water quality; and E. BMPs.

#### **SCHEDULE OF COMPLIANCE (SOC):**

Per § 644.051, RSMo, a permit may be issued with a Schedule of Compliance (SOC) to provide time for a facility to come into compliance with new state or federal effluent regulations, water quality standards, or other requirements. Such a schedule is not allowed if the facility is already in compliance with the new requirement or if prohibited by other statute or regulation. An SOC includes an enforceable sequence of interim requirements (e.g. actions, operations, or milestone events) leading to compliance with the Missouri Clean Water Law, its implementing regulations, and/or the terms and conditions of an operating permit. *See also* Section 502(17) of the CWA, and 40 CFR 122.2. For new effluent limitations, the permit may include interim monitoring for the specific parameter to demonstrate the facility is not already in compliance with the new requirement. Per 40 CFR 122.47(a)(1) and 10 CSR 20-7.031(11), compliance must occur as soon as possible. If the permit provides a schedule for meeting new water quality based effluent limits, an SOC must include an enforceable, final effluent limitation in the permit even if the SOC extends beyond the life of the permit.

- ✓ Not Applicable: This permit does not contain a SOC.

#### **SETBACKS:**

Setbacks, sometimes called separation distances, are common elements of permits and are established to provide a margin of safety in order to protect the receiving water and other features from accidents, spills, unusual events, etc. Specific separation distances are included in 10 CSR 20-8 for minimum design standards of wastewater structures. While wastewater is considered separately from stormwater under this permit, the guides and Chapter 8 distances may remain relevant to requirements under this permit if deemed appropriate by the permittee.

- ✓ Discharge to the watersheds of a Metropolitan No-Discharge Stream (10 CSR 20-7.031 Table F) is authorized by this permit if the discharges are in compliance with 10 CSR 20-7.015(5) and 10 CSR 20-7.031(7). Discharges to these watersheds are authorized for uncontaminated stormwater discharges only.
- ✓ This permit authorizes stormwater discharges which are located in a way to allow water to be released into sinkholes, caves, fissures, or other openings in the ground which could drain into aquifers (except losing streams) per 10 CSR 20-7.015(7). It is the best professional judgment of the permit writer to allow discharges to losing streams as the effluent is stormwater only.
- ✓ This permit authorizes stormwater discharge in the watersheds of Outstanding state Resource Waters (OSRW); Outstanding National Resources Waters (ONRW), which includes the Ozark National Riverways and the National Wild and Scenic Rivers System; and impaired waters as designated in the 305(b) Report provided no degradation of water quality occurs in the OSRW and ONRW due to discharges from the permitted facility per 10 CSR 20-7.015(6)(B) and 10 CSR 20-7.031(3)(C). Additionally, if the facility is found to be causing degradation or contributing to an impairment by discharging a pollutant of concern during an inspection or through complaint investigations, they will be required to become a no discharge facility or obtain a site specific permit with more stringent monitoring and SWPPP requirements. Missouri's impaired waters can be found at <https://dnr.mo.gov/water/what-were-doing/water-planning/quality-standards-impaired-waters-total-maximum-daily-loads/impaired-waters>. Sites within 1000 feet of a OSRW, ONRW, or water impaired for sediment must operate as a no-discharge facility. These additional protections are borrowed from the USEPA 2021 draft Construction General Permit.

**SLUDGE – DOMESTIC BIOSOLIDS:**

Biosolids are solid materials resulting from domestic wastewater treatment meeting federal and state criteria for beneficial use (i.e. fertilizer). Sewage sludge is solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works; including, but not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in a treatment works.

✓ This permit does not authorize discharge or land application of biosolids. Sludge/biosolids is not generated by this industry.

**SLUDGE – INDUSTRIAL:**

Industrial sludge is solid, semi-solid, or liquid residue generated during the treatment of industrial process wastewater in a treatment works; including, but not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment process; scum and solids filtered from water supplies and backwashed; and a material derived from industrial sludge.

✓ Not applicable; sludge is not generated by this industry.

**SPILL REPORTING:**

Any emergency involving a hazardous substance must be reported to the Department's 24 hour Environmental Emergency Response hotline at (573) 634-2436 at the earliest practicable moment after discovery. The Department may require the submittal of a written report detailing measures taken to clean up a spill. These reporting requirements apply when the spill results in chemicals or materials leaving the permitted property or reaching waters of the state. This requirement is in addition to the noncompliance reporting requirement found in Standard Conditions Part I. <https://dnr.mo.gov/waste-recycling/investigations-cleanups/environmental-emergency-response>.

Underground and above ground storage devices for petroleum products, vegetable oils, and animal fats may be subject to control under federal Spill Prevention, Control, and Countermeasure Regulation and are expected to be managed under those provisions, if applicable. Substances regulated by federal law under the Resource Conservation and Recovery Act (RCRA) or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) which are transported, stored, or used for maintenance, cleaning or repair shall be managed according to the provisions of RCRA and CERCLA.

**STORMWATER POLLUTION PREVENTION PLAN (SWPPP):**

In accordance with 40 CFR 122.44(k), BMPs must be used to control or abate the discharge of pollutants when: 1) Authorized under section 304(e) of the CWA for the control of toxic pollutants and hazardous substances from ancillary industrial activities; 2) Authorized under section 402(p) of the CWA for the control of stormwater discharges; 3) Numeric effluent limitations are infeasible; or 4) the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA. In accordance with the EPA's *Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites*, (Document number EPA 833-R-06-004) published by the EPA in 2007 [https://www.epa.gov/sites/production/files/2015-10/documents/sw\\_swppp\\_guide.pdf](https://www.epa.gov/sites/production/files/2015-10/documents/sw_swppp_guide.pdf), BMPs are measures or practices used to reduce the amount of pollution entering waters of the state from a permitted facility. BMPs may take the form of a process, activity, or physical structure. Additionally, in accordance with the Stormwater Management, a SWPPP is a series of steps and activities to 1) identify sources of pollution or contamination, and 2) select and carry out actions which prevent or control the pollution of storm water discharges. Additional information can be found in *Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices* (EPA 832-R-92-006; September 1992).

A SWPPP must be prepared if the SIC code for the facility is found in 40 CFR 122.26(b)(14) and/or 10 CSR 20-6.200(2). A SWPPP may be required of other facilities where stormwater has been identified as necessitating better management.

The purpose of a SWPPP is to comply with all applicable stormwater regulations by creating an adaptive management plan to control and mitigate stream pollution from stormwater runoff. Developing a SWPPP provides opportunities to employ appropriate BMPs to minimize the risk of pollutants being discharged during storm events. The following paragraph outlines the general steps the permittee should take to determine which BMPs will work to achieve the benchmark values or limits in the permit. This section is not intended to be all encompassing or restrict the use of any physical BMP or operational and maintenance procedure assisting in pollution control. Additional steps or revisions to the SWPPP may be required to meet the requirements of the permit.

Areas which should be included in the SWPPP are identified in 40 CFR 122.26(b)(14). Once the potential sources of stormwater pollution have been identified, a plan should be formulated to best control the amount of pollutant being released and discharged by each activity or source. This should include, but is not limited to, minimizing exposure to stormwater, good housekeeping measures, proper facility and equipment maintenance, spill prevention and response, vehicle traffic control, and proper materials handling. Once a plan has been developed, the facility will employ the control measures determined to be adequate to prevent pollution from entering waters of the state. The facility will conduct inspections of the BMPs to ensure they are working properly and re-evaluate any BMP not achieving compliance with permitting requirements. For example if the BMP being employed is deficient in controlling stormwater pollution, corrective action should be taken to repair, improve, or replace the failing BMP. If failures do occur, continue this trial and error process until appropriate BMPs have been established.

The EPA has developed factsheets on the pollutants of concern for specific industries along with the BMPs to control and minimize stormwater (<https://www.epa.gov/npdes/stormwater-discharges-industrial-activities>). Along with EPA's factsheets, the International Stormwater BMP database (<https://bmpdatabase.org/>) may provide guidance on BMPs appropriate for specific industries.

For new, altered, or expanded stormwater discharges, the SWPPP shall identify reasonable and effective BMPs while accounting for environmental impacts of varying control methods. The antidegradation analysis must document why no discharge or no exposure options are not feasible. The selection and documentation of appropriate control measures shall serve as an alternative analysis of technology and fulfill the requirements of antidegradation [10 CSR 20-7.031(3)].

Alternative analysis evaluation of the BMPs is a structured evaluation of BMPs which are reasonable and cost effective. The alternative analysis evaluation should include practices designed to be: 1) non-degrading; 2) less degrading; or 3) degrading water quality. The glossary of the *Antidegradation Implementation Procedure* defines these three terms. The chosen BMP will be the most reasonable and effective management strategy while ensuring the highest statutory and regulatory requirements are achieved and the highest quality water attainable for the facility is discharged. The alternative analysis evaluation must demonstrate why "no discharge" or "no exposure" is not a feasible alternative at the facility. This structured analysis of BMPs serves as the antidegradation review, fulfilling the requirements of 10 CSR 20-7.031(3) Water Quality Standards and *Antidegradation Implementation Procedure*, Section II.B.

- ✓ Applicable: A SWPPP shall be developed and implemented for each site and shall incorporate required practices identified by the Department with jurisdiction, incorporate control practices specific to site conditions, and provide for maintenance and adherence to the plan.

#### **UNDERGROUND INJECTION CONTROL (UIC):**

The UIC program for all classes of wells in the State of Missouri is administered by the Missouri Department of Natural Resources and approved by EPA pursuant to section 1422 and 1425 of the Safe Drinking Water Act (SDWA) and 40 CFR 147 Subpart AA. Injection wells are classified based on the liquids which are being injected. Class I wells are hazardous waste wells which are banned by RSMo 577.155; Class II wells are established for oil and natural gas production; Class III wells are used to inject fluids to extract minerals; Class IV wells are also banned by Missouri in RSMo 577.155; Class V wells are shallow injection wells; some examples are heat pump wells and groundwater remediation wells. Domestic wastewater being disposed of sub-surface is also considered a Class V well.

In accordance with 40 CFR 144.82, construction, operation, maintenance, conversion, plugging, or closure of injection wells shall not cause movement of fluids containing any contaminant into Underground Sources of Drinking Water (USDW) if the presence of any contaminant may cause a violation of drinking water standards or groundwater standards under 10 CSR 20-7.031 or other health-based standards or may otherwise adversely affect human health. If the Department finds the injection activity may endanger USDWs, the Department may require closure of the injection wells or other actions listed in 40 CFR 144.12(c), (d), or (e). In accordance with 40 CFR 144.26, the permittee shall submit a Class V Well Inventory Form for each active or new underground injection well drilled, or when the status of a well changes, to the Missouri Department of Natural Resources, Geological Survey Program, P.O. Box 250, Rolla, Missouri 65402. Single family residential septic systems and non-residential septic systems used solely for sanitary waste and having the capacity to serve fewer than 20 persons a day are excluded from the UIC requirements (40 CFR 144.81(9)).

- ✓ Not applicable; this permit does not authorize subsurface wastewater systems or other underground injection. These activities must be assessed under an application for a site specific permit. Certain discharges of stormwater into sinkholes may qualify as UIC. It is important the permittee evaluate all stormwater basins, even those holding water; as sinkholes have varying seepage rates. This permit does not allow stormwater discharges into sinkholes. The facility must ensure sinkholes are avoided in the construction process. The State's online mapping resource <https://modnr.maps.arcgis.com/apps/webappviewer/index.html?id=87ebef4af15d438ca658ce0b2bbc862e> has a sinkhole layer.

**VARIANCE:**

Per the Missouri Clean Water Law Section 644.061.4, variances shall be granted for such period of time and under such terms and conditions as shall be specified by the commission in its order. The variance may be extended by affirmative action of the commission. In no event shall the variance be granted for a period of time greater than is reasonably necessary for complying with the Missouri Clean Water Law Section 644.006 to 644.141 or any standard, rule, or regulation promulgated pursuant to Missouri Clean Water Law Section 644.006 to 644.141.

- ✓ Not Applicable: This permit is not drafted under premises of a petition for variance.

**WASTELOAD ALLOCATIONS (WLA) FOR LIMITATIONS:**

Per 10 CSR 20-2.010(78), the amount of pollutant each discharger is allowed by the Department to release into a given stream after the Department has determined total amount of pollutant which may be discharged into the stream without endangering its water quality. Water quality based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA's Technical Support Document For Water Quality-based Toxics Control (TSD) (EPA/505/2-90-001).

- ✓ Not applicable; water quality limitations were not applied in this permit.

**WATER QUALITY STANDARDS:**

Per 10 CSR 20-7.031(4), General Criteria shall be applicable to all waters of the state at all times, including mixing zones. Additionally, 40 CFR 122.44(d)(1) directs the Department to include in each NPDES permit conditions to achieve water quality established under Section 303 of the CWA, including state narrative criteria for water quality.

**WHOLE EFFLUENT TOXICITY (WET) TEST:**

Per 10 CSR 20-7.031(1)(FF), a toxicity test conducted under specified laboratory conditions on specific indicator organism; and per 40 CFR 122.2, the aggregate toxic effect of an effluent measured directly by a toxicity test. A WET test is a quantifiable method of determining if a discharge from a facility may be causing toxicity to aquatic life by itself, in combination with, or through synergistic responses when mixed with receiving water.

- ✓ Not applicable: At this time, permittees are not required to conduct a WET test. This permit is for stormwater only.

#### **PART IV – EFFLUENT LIMITATIONS DETERMINATION**

##### **EPA Construction General Permit (CGP)**

The CGP was used to research and support best professional judgment decisions made in establishing technology-based conditions for this general permit which are consistent with national standards. The permit writer determined the standards established by the CGP are achievable and consistent with federal regulations. Additionally, the conditions reflecting the best practicable technology currently available are utilized to implement the ELG.

In this general permit, technology-based effluent conditions are established through the SWPPP and BMP requirements. Effective BMPs should be designed on a site-specific basis. The implementation of inspections provides a tool for each facility to evaluate the effectiveness of BMPs to ensure protection of water quality. Any flow through an outfall is considered a discharge. Future permit action due to permit modification may contain new operating permit terms and conditions which supersede the terms and conditions, including effluent limitations, of this operating permit.

#### **PART V–REPORTING REQUIREMENTS**

##### **SAMPLING:**

The permittee is not required to sample stormwater under this permit. The Department may require sampling and reporting as a result of illegal discharges, compliance issues related to water quality concerns or BMP effectiveness, or evidence of off-site impacts from activities at the facility. If such an action is needed, the Department will specify in writing the sampling requirements, including such information as location and extent. If the permittee refuses to perform sampling when required, the Department may terminate the general permit and require the facility to obtain a site-specific permit with sampling requirements.

##### **REPORTING:**

There are quarterly reporting requirements for MO-R100xxx land disturbance permits. Project specific information is required to be report to the Department through the eDMR system.

#### **PART VI – RAINFALL VALUES FOR MISSOURI & SURFACE WATER BUFFER ZONES**

Knowledge of the 2-year, 24-hour storm event is used in this permit for two main reasons:

- 1) The design, installation, and maintenance of effective erosion and sediment controls to minimize the discharge of pollutants.
- 2) If the seven-day inspection frequency is utilized, an inspection must occur within 48 hours after any storm event equal to or greater than a 2-year, 24 hour storm has ceased.

For site-specific 2-year, 24-hour storm event information utilize the National Oceanic and Atmospheric Administration’s National Weather Service Atlas 14 (NOAA Atlas 14) which is located at [https://hdsc.nws.noaa.gov/hdsc/pfds/pfds\\_map\\_cont.html](https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html). For more information visit; [https://www.weather.gov/media/owp/oh/hdsc/docs/Atlas14\\_Volume8.pdf](https://www.weather.gov/media/owp/oh/hdsc/docs/Atlas14_Volume8.pdf).

**Surface Water Buffer Zones:** In order to design controls that match the sediment removal efficiency of a 50-foot buffer, you first need to know what this efficiency is for your site. The sediment removal efficiencies of natural buffers vary according to a number of site-specific factors, including precipitation, soil type, land cover, slope length, width, steepness, and the types of erosion and sediment controls used to reduce the discharge of sediment prior to the buffer. For additional information;

[https://www.epa.gov/sites/default/files/2017-02/documents/2017\\_cgp\\_final\\_appendix\\_g\\_-\\_buffer\\_reqs\\_508.pdf](https://www.epa.gov/sites/default/files/2017-02/documents/2017_cgp_final_appendix_g_-_buffer_reqs_508.pdf)

## **PART VII – ADMINISTRATIVE REQUIREMENTS**

On the basis of preliminary staff review and applicable standards and regulations, the Department, as administrative agent for the Missouri Clean Water Commission, proposes to issue a permit(s) subject to certain effluent limitations, schedules, and special conditions contained herein and within the permit. The proposed determinations are tentative pending public comment.

### **PUBLIC MEETING:**

The department hosted three public meetings for this permit. The meetings were held on January 27, February 17, and March 9, 2021.

### **PUBLIC NOTICE:**

The Department shall give public notice when a draft permit has been prepared and its issuance is pending. Additionally, public notice will be issued if a public hearing is to be held because of a significant degree of interest or because of water quality concerns related to a draft permit. No public notice is required when a request for a permit modification or termination is denied; however, the requester and facility must be notified of the denial in writing.

The Department must give public notice of a pending permit or of a new or reissued Missouri State Operating Permit. The public comment period is a length of time not less than thirty (30) days following the date of the public notice, during which interested persons may submit written comments about the proposed permit.

For persons wanting to submit comments regarding this proposed permit, please refer to the Public Notice page located at the front of this draft permit. The Public Notice page gives direction on how and where to submit appropriate comments.

- ✓ The Public Notice period for this permit is started March 25, 2022 and ended April 25, 2022. Two comment letters were received.

**DATE OF FACT SHEET:** 03/2/2022

### **COMPLETED BY:**

**SARAH WRIGHT**

**MS4 & LAND DISTURBANCE PERMITTING COORDINATOR**

**MISSOURI DEPARTMENT OF NATURAL RESOURCES**

**WATER PROTECTION PROGRAM**

**OPERATING PERMITS SECTION - STORMWATER AND CERTIFICATION UNIT**

**(573) 526-1139**

**[Sarah.wright@dnr.mo.gov](mailto:Sarah.wright@dnr.mo.gov), [dnr.generalpermits@dnr.mo.gov](mailto:dnr.generalpermits@dnr.mo.gov)**



**APPENDIX B**

**\*NOT USED\***

**APPENDIX C**

**AUTHORIZED REPRESENTATIVE  
DESIGNATION**

**AUTHORIZED REPRESENTATIVE DESIGNATION**

**Construction Site**  
Mizzou North Demolition  
Columbia, Boone County, Missouri

**STORM WATER POLLUTION PREVENTION PLAN**  
**DATED July 2022**

I, The Curators of University of Missouri hereby designate the person or company specifically described below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the Missouri State Operating Permit - General Permit by the Missouri Clean Water Commission, any local land disturbance permits, and this Storm Water Pollution Prevention Plan at the above indicated construction site. The designee is authorized to implement, maintain, and enforce all aspects of the Storm Water Pollution Prevention Plan (SWPPP), sign any reports/documents in the (SWPPP), and all other documents required by the land disturbance permit(s). The designee is authorized to amend the SWPPP as deemed necessary to maintain compliance with all environmental requirements.

Authorized Representative:

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

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

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

Phone Number: \_\_\_\_\_

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in the Missouri Clean Water Commission, Missouri State Operating Permit, General Operating Permit.

**The Curators of University of Missouri**

Operators Signature: \_\_\_\_\_

Print Name and Title: \_\_\_\_\_

Date: \_\_\_\_\_

**APPENDIX D**

**AUTHORIZED REPRESENTATIVE  
CERTIFICATION**

**AUTHORIZED REPRESENTATIVE CERTIFICATION**

**Construction Site**  
Mizzou North Demolition  
Columbia, Boone County, Missouri

**STORM WATER POLLUTION PREVENTION PLAN**  
**DATED July 2022**

AUTHORIZED REPRESENTATIVE CERTIFICATION:

"I certify under penalty of law that I understand the terms and conditions of the Missouri State Operating Permit - General Operating Permit by the Missouri Clean Water Commission that authorizes the discharge of storm water associated with construction or land disturbance activity from the construction site as part of this certification. Further, by my signature, I understand that I am fully responsible, along with all other contractors and subcontractors signing such certifications who are performing work activities under this contract, to comply with all provisions and requirements of the General Operating Permit and this Storm Water Pollution Prevention Plan. I understand that I, and my company, are legally required under the federal Clean Water Act and the Code of Missouri, to ensure compliance with the terms and conditions of the General Operating Permit and this Storm Water Pollution Prevention Plan (SWPPP) developed under the Missouri Clean Water Law and the National Pollution Discharge Elimination System (NPDES). I further certify that I and my company shall provide all necessary training and continuing education to all applicable personnel and subcontractors to ensure a complete understanding of all provisions and requirements of the General Operating Permit and this Storm Water Pollution Prevention Plan prior to these entities beginning any work activities on this site."

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Print Name & Title: \_\_\_\_\_

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

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

Phone Number: \_\_\_\_\_

Scope of Services: \_\_\_\_\_

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## **APPENDIX E**

### **LIST OF SUBCONTRACTORS**

**LIST OF SUBCONTRACTORS**

**Construction Site**  
Mizzou North Demolition  
Columbia, Boone County, Missouri

**STORM WATER POLLUTION PREVENTION PLAN**  
**DATED July 2022**

*(to be filled in by Contractor after award of contract, make copies of this form as necessary)*

**Subcontractor:**

Company or Organization Name: \_\_\_\_\_

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

City, State, Zip Code: \_\_\_\_\_

Contact Name: \_\_\_\_\_ Phone #: \_\_\_\_\_

Contact Email: \_\_\_\_\_

**Subcontractor:**

Company or Organization Name: \_\_\_\_\_

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

City, State, Zip Code: \_\_\_\_\_

Contact Name: \_\_\_\_\_ Phone #: \_\_\_\_\_

Contact Email: \_\_\_\_\_

**Subcontractor:**

Company or Organization Name: \_\_\_\_\_

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

City, State, Zip Code: \_\_\_\_\_

Contact Name: \_\_\_\_\_ Phone #: \_\_\_\_\_

Contact Email: \_\_\_\_\_

**Subcontractor:**

Company or Organization Name: \_\_\_\_\_

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

City, State, Zip Code: \_\_\_\_\_

Contact Name: \_\_\_\_\_ Phone #: \_\_\_\_\_

Contact Email: \_\_\_\_\_

**APPENDIX F**

**SUBCONTRACTORS  
CERTIFICATION**



**SUBCONTRACTORS CERTIFICATION**

**Construction Site**  
Mizzou North Demolition  
Columbia, Boone County, Missouri

**STORM WATER POLLUTION PREVENTION PLAN**  
**DATED July 2022**

SUBCONTRACTOR'S CERTIFICATION:

"I certify under penalty of law that I understand the terms and conditions of the Missouri State Operating Permit - General Operating Permit by the Missouri Clean Water Commission that authorizes the discharge of storm water associated with construction or land disturbance activity from the construction site as part of this certification. Further, by my signature, I understand that I am fully responsible, along with all other contractors and subcontractors signing such certifications who are performing work activities under this contract, to comply with all provisions and requirements of the General Operating Permit and this Storm Water Pollution Prevention Plan. I understand that I, and my company, are legally required under the federal Clean Water Act and the Code of Missouri, to ensure compliance with the terms and conditions of the General Operating Permit and this Storm Water Pollution Prevention Plan (SWPPP) developed under the Missouri Clean Water Law and the National Pollution Discharge Elimination System (NPDES)."

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Print Name & Title: \_\_\_\_\_

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

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

Phone Number: \_\_\_\_\_

Scope of Services: \_\_\_\_\_

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## **APPENDIX G**

### **IMPLEMENTATION SCHEDULE**

**IMPLEMENTATION SCHEDULE (Page 1 of 2)**

Mizzou North Demolition  
 115 W. Business Loop 70  
 Columbia, Boone County, Missouri

Please note that the site plan shows two phases of demolition starting with at the north end of the site and working towards the south end of the site.

Construction Activity	Sequence of Events				Contractor Responsible for Implementation
	Proposed Initiation Date	Proposed Completion Date	Actual Initiation Date	Actual Completion Date	
1. Pre-construction meeting for SWPPP training prior to any construction.					
2. Install erosion control as shown on the erosion control plan.					
3. Commence site demolition.					
4. Commence site grading as demolition allows.					
5. Disturbed areas of the site where demolition activity has ceased for more than 14 days shall be temporarily seeded, mulched, and watered, except as precluded by snow cover. In the event of snow cover, stabilization measures must be initiated as soon as practical thereafter. Disturbed areas of the site where construction activity will cease for 12 months or more shall be permanently seeded and mulched.					
6. Complete all final grading, topsoil placement, seeding in all disturbed areas. Excess topsoil shall be wasted onsite as directed by owner.					
7. Remove all sediment, trash, and debris from sewers and structures upon substantial completion. Removed sediment shall be hauled offsite.					
8. Remove all temporary erosion and sediment control devices when disturbed areas are stabilized.					
Others:					



## **APPENDIX H**

### **INSPECTION REPORT FORMS**

**INSPECTION REPORT (Page 1 of 6)**  
Mizzou North Demolition  
115 W. Business Loop 70  
Columbia, Boone County, Missouri  
NPDES Tracking Number: MOR100039

General Information			
<b>Date of Inspection</b>		<b>Start/End Time</b>	
<b>Inspector's Name(s)</b>			
<b>Inspector's Title(s)</b>			
<b>Inspector's Contact Information</b>			
<b>Inspector's Qualifications</b>	See Section 6 of SWPPP.		
<b>Describe present phase of construction</b>			
<b>Type of Inspection:</b>			
<input type="checkbox"/> Regular (7 calendar day) <input type="checkbox"/> Pre-storm event <input type="checkbox"/> During storm event <input type="checkbox"/> Post-storm event			
Weather Information			
<b>Has there been a storm event since the last inspection?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No			
<b>If yes, provide:</b>			
Storm Start Date & Time:	Storm Duration (hrs):	Approximate Amount of Precipitation (in):	
<b>Weather at time of this inspection?</b>			
<input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Rain <input type="checkbox"/> Sleet <input type="checkbox"/> Fog <input type="checkbox"/> Snowing <input type="checkbox"/> High Winds <input type="checkbox"/> Other: _____      Temperature: _____			
<b>Have any discharges occurred since the last inspection?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No			
<b>If yes, describe:</b>			
<b>Is there any discharges at the time of inspection?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No			
<b>If yes, describe:</b>			

**CERTIFICATION STATEMENT**

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

Print name and title: \_\_\_\_\_

Inspector's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**INSPECTION REPORT (Page 2 of 6)**

Mizzou North Demolition  
 115 W. Business Loop 70  
 Columbia, Boone County, Missouri  
 NPDES Tracking Number: MOR100039

**Site-specific BMPs**

Carry a copy of the SWPPP maps during inspections.

Site-Specific BMPs					
BMP	BMP Installed? (yes, no, or N/A)	BMP Maintenance Required? (yes, no, or N/A)	Corrective Action Needed and Notes	Responsible Party for Corrective Action	Implementation Date of Corrective Action
Site Staff Training on Erosion & Sediment Control					
Site Staff Training on Spill Prevention & Response Plan					
Maintaining Equipment					
Existing Vegetation Preservation					
Tree Preservation Barrier					
Staging Area(s)					
Vehicle/Equipment Maintenance & Fueling Area					
Toilet Facilities					
Maintaining New Vegetated Areas					
Gravel Construction Entrances, Exits, & Laydown					
Phasing Land Clearing Activities					
Disposing of Trash & Debris					

**INSPECTION REPORT (Page 3 of 6)**

Mizzou North Demolition  
 115 W. Business Loop 70  
 Columbia, Boone County, Missouri  
 NPDES Tracking Number: MOR100039

Site-Specific BMPs						
BMP	BMP Installed? (yes, no, or N/A)	BMP Maintenance Required? (yes, no, or N/A)	Corrective Action Needed and Notes	Responsible Party for Corrective Action	Implementation Date of Corrective Action	
Construction Waste Materials Containment						
Hazardous Waste Materials Containment						
Pavement/Curb & Gutter Sweeping						
Curb Inlet Filters Using Gutterbuddy, Sediment Logs, Etc.						
Wind Erosion & Dust Control						
Silt Fences						
Topsoil Stockpile and Placement						
Management of Excavation Spoil Materials						
Dewatering into BMP(s)						
Temporary Seed & Mulch Disturbed Areas						
Light Compaction of All Placed Topsoil						





**INSPECTION REPORT (Page 5 of 6)**

Mizzou North Demolition  
 115 W. Business Loop 70  
 Columbia, Boone County, Missouri  
 NPDES Tracking Number: MOR100039

**General Site Issues**

Below are some general site issues that should be assessed during inspections.

General Site Issues					
BMP/activity	Implemented? (yes, no, or N/A)	Maintenance Required? (yes, no, or N/A)	Corrective Action Needed and Notes	Responsible Party Corrective Action	Implementation Date of Corrective Action
Are all slopes and disturbed areas not actively being worked properly stabilized?					
Are natural resource areas (e.g., streams, wetlands, mature trees, etc.) protected with barriers or similar BMP's?					
Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?					
Are discharge points and receiving waters free of any sediment deposits?					
Are storm drain inlets properly protected?					
Is the construction exit(s) preventing sediment from being tracked onto the street(s)?					

**INSPECTION REPORT (Page 6 of 6)**

Mizzou North Demolition  
 115 W. Business Loop 70  
 Columbia, Boone County, Missouri  
 NPDES Tracking Number: MOR100039

General Site Issues					
BMP/activity	Implemented? (yes, no, or N/A)	Maintenance Required? (yes, no, or N/A)	Corrective Action Needed and Notes	Responsible Party Corrective Action	Implementation Date of Corrective Action
Are the surrounding streets clean and free of mud/dust/trash from the project?					
Is trash/litter from work areas collected and placed in covered dumpsters?					
Are washout facilities (e.g., paint, stucco, concrete) available, clearly marked, and maintained?					
Has the on-site SWPPP been updated?					
Other:					

### **Recommended Inspection Sequence – For information only**

You should conduct thorough inspections of the site, making sure to inspect all areas and BMP's. The seven activities listed below are a recommended inspection sequence that will help you conduct a thorough inspection (EPA in *Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites* (adapted from MPCA 2004).

1. Plan your inspection
  - Create a checklist to use during the inspection (see Inspection Report)
  - Obtain a copy of the site map with BMP locations marked
  - Plan to walk the entire site, including discharge points from the site and any off-site support activities such as concrete batch plants should also be inspected.
  - Follow a consistent pattern each time to ensure you inspect all areas (for example, starting at the lowest point and working uphill)
2. Inspect discharge points and downstream, off-site areas
  - Inspect discharge locations to determine whether erosion and sediment control measures are effective
  - Inspect nearby downstream locations, if feasible
  - Walk *down the street* to inspect off-site areas for signs of discharge. This is important in areas with existing curbs and gutters
  - Inspect downslope municipal catch basin inlets to ensure that they are adequately protected
3. Inspect perimeter controls and slopes
  - Inspect perimeter controls such as silt fences to determine if sediment should be removed
  - Check the structural integrity of the BMP to determine if portions of the BMP need to be replaced
  - Inspect slopes and temporary stockpiles to determine if erosion controls are effective
4. Compare BMP's in the site plan with the construction site conditions
  - Determine whether BMP's are in place as required by the site plan
  - Evaluate whether BMP's have been adequately installed and maintained
  - Look for areas where BMP's are needed but are missing and are not in the SWPPP
5. Inspect construction site entrances
  - Inspect the construction exits to determine if there is tracking of sediment from the site onto the street
  - Refresh or replace the rock in designated entrances
  - Look for evidence of additional construction exits being used that are not in the SWPPP or are not stabilized
  - Sweep the street if there is evidence of sediment
6. Inspect sediment controls
  - Inspect any sediment basins for sediment accumulation
  - Remove sediment when it reduces the capacity of the basin by the specified amount (many permits have specific requirements and include those in the SWPPP)
7. Inspect pollution prevention and good housekeeping practices
  - Inspect trash areas to ensure that waste is properly contained
  - Inspect material storage and staging areas to verify potential pollutant sources are not exposed to stormwater runoff
  - Verify that concrete, paint, and stucco washouts are being used properly and are correctly sized for the volume of wash water
    - Inspect vehicle/equipment fueling and maintenance areas for signs of stormwater pollutant exposure

**APPENDIX I**

**SWPPP AMENDMENT REPORT FORM  
&  
OVERALL SWPPP AMENDMENT LOG**

**SWPPP AMENDMENT REPORT FORM**  
Mizzou North Demolition  
Columbia, Boone County, Missouri

*(MASTER FORM – copy this page and fill in for each amendment)*

**AMENDMENT NUMBER:** \_\_\_\_\_

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

**QUALIFICATIONS OF INSPECTOR:** \_\_\_\_\_

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

**CHANGES REQUIRED TO THE STORMWATER POLLUTION PREVENTION PLAN:** \_\_\_\_\_

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

**REASONS FOR CHANGES:** \_\_\_\_\_

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

**TO BE PERFORMED BY:** \_\_\_\_\_

\_\_\_\_\_  
**ON OR BEFORE:** \_\_\_\_\_

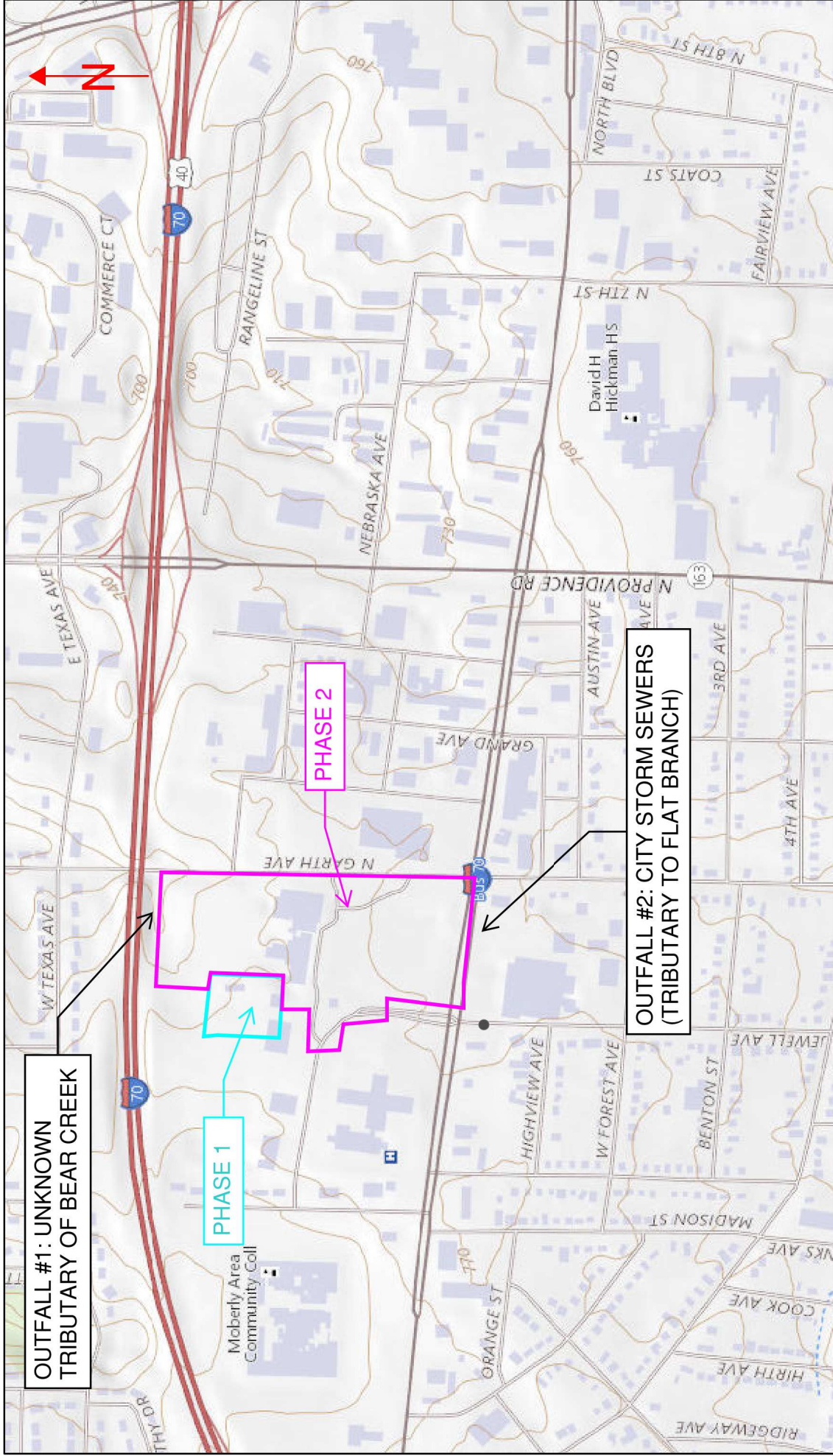


## **APPENDIX J**

### **GENERAL LOCATION MAP**



# The National Map Advanced Viewer - Location Map



7/15/2022, 1:02:14 PM

1:9,028

USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census

USGS  
2021 USGS

## **APPENDIX K**

### **CONSTRUCTION SITE NOTICES**

**EMERGENCY, SITE, & SWPPP CONTACT INFORMATION  
 TO BE FILLED OUT BY CONTRACTOR AND POSTED ON-SITE**

<b>Emergency: Fire, Police, &amp; Ambulance</b>		Phone:	911
<b>Operator:</b>	<b>Address:</b>		
The Curators of University of Missouri	180 General Services Building, Columbia, MO 65211	Phone:	(573) 882-3950
24 Hour Contact:	Ted Haeussler	Mobile:	(573) 882-7018
<b>General Contractor:</b>	<b>Address:</b>		
		Phone:	
24 Hour Contact:		Mobile:	
24 Hour Contact:		Mobile:	
<b>Subcontractors:</b>	<b>Company Address / Contact Name:</b>		
Sub #1:		Phone:	
Sub #2:		Phone:	
Sub #3:		Phone:	
<b>City/County Contact:</b>	Columbia Public Works Department	Phone:	573-874-7250
<b>MDNR:</b>	Water Pollution Control Program	Phone:	1-573-751-1300
<b>National Response Center:</b>		Phone:	1-800-424-8802
<b>SWPPP Location:</b>	115 W. Business Loop 70, Columbia, MO 65203		
<b>SWPPP Contact:</b>	Phone:		

**APPENDIX L**

**RECORD OF PERSONNEL  
TRAINING ACTIVITIES FORM**



**APPENDIX M**

**REPORTABLE QUANTITY  
RELEASE FORM**



**APPENDIX N**

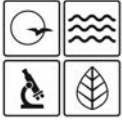
**RECORD OF RAINFALL**





**APPENDIX O**

**NOTICE OF TERMINATION(S)  
&  
FINAL STABILIZATION/TERMINATION CHECKLIST**



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
 WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH  
**REQUEST FOR TERMINATION OF OPERATING PERMIT**  
 (REPLACES TERMINATION FORMS H AND J)

**FOR OFFICE USE ONLY**

DATE RECEIVED

**IF A FACILITY OR SITE HAS BEEN SOLD, BUT PERMITTED ACTIVITIES HAVE NOT CEASED, A TRANSFER OF OWNERSHIP FORM (MO 780-1517) MUST BE COMPLETED RATHER THAN A TERMINATION FORM.**

**ALL APPLICABLE SECTIONS OF THIS FORM MUST BE COMPLETED.**

**1. FACILITY INFORMATION**

PERMIT NUMBER		COUNTY	
NAME OF FACILITY			
PHYSICAL ADDRESS		CITY	STATE ZIP CODE
FACILITY CONTACT NAME	FACILITY CONTACT TELEPHONE NUMBER	FACILITY CONTACT EMAIL	

**2. OWNER**

NAME		TELEPHONE NUMBER WITH AREA CODE	
ADDRESS		CITY	STATE ZIP CODE
EMAIL			

**3. CONTINUING AUTHORITY**

NAME		TELEPHONE NUMBER WITH AREA CODE	
ADDRESS		CITY	STATE ZIP CODE
EMAIL			

**4. REASON FOR TERMINATION REQUEST (CHECK ONE)**

- Permitted activities have ceased, or facility is closed (must select facility type in section five and attach photographs or any other supporting documents as required).
- General Permit MO-G \_\_\_\_\_ or MO-R \_\_\_\_\_ has been issued and covers all regulated activities.
- Site specific permit MO- \_\_\_\_\_ has been issued and covers all regulated activities.
- Facility has obtained a "No Exposure" certification, MO-NX \_\_\_\_\_.
- Industrial activity (SIC Code # \_\_\_\_\_) is not regulated.
- For CAFOs, facility size is unregulated (Class II and smaller operations only).
- Other (Specify).

**5. FACILITY TYPE (CHECK ONE FACILITY TYPE, COMPLETE ONLY IF PERMITTED ACTIVITY HAS CEASED OR FACILITY HAS CLOSED)**

- For land disturbance sites, the area is stabilized; perennial vegetation, pavement, buildings or other permanent structures cover all areas that have been disturbed; no further land disturbance activities are planned; all building construction (commercial or residential) is completed; temporary best management practices are removed, and construction equipment is removed. With respect to areas that have been vegetated, vegetation cover shall be at least 70 percent over 100 percent of the site not covered in impervious material. Attach photographs showing stabilized areas.
- For wastewater treatment plants, the treatment plant is removed and sludge was removed and properly disposed of, and a closure plan in accordance with [10 CSR 20-6.010\(12\)](#) or [10 CSR 20-6.015\(5\)](#) was approved and implemented. Attach documentation required by the approved closure plan and photographs of the closed area. See the *Water Treatment Plant Closure* -PUB2568 fact sheet at [dnr.mo.gov/pubs/pub2568.htm](http://dnr.mo.gov/pubs/pub2568.htm) for more information on closure requirements for wastewater treatment plants.
- For industrial facilities, regulated activities have ceased, no “significant materials” remain on-site and disturbed areas are properly stabilized or vegetated. The area is stabilized when perennial vegetation, pavement, buildings or structures using permanent materials cover all areas that have been disturbed. Vegetation cover shall be at least 70 percent over 100 percent of the site not covered in impervious material. Attach applicable closure documents and photographs of the closed area that demonstrate no permitted activities or materials remain.
- For quarries or sand and gravel operations, submit documentation of release from the department’s Land Reclamation Program.
- For landfills, official closure has been received from department’s Solid Waste Management Program (SWMP); cap is vegetated as required by SWMP; and any additional industrial activities are permitted appropriately (i.e., transfer stations, mulching operations, land disturbance, etc.). Attach the official SWMP closure letter and permit numbers of any continuing active industrial or land disturbance activities.
- For CAFOs
  - Class I CAFOs must properly close lagoons and waste storage structures per a closure plan in accordance with [10 CSR 20-6.300\(6\)](#) and approved by the department. Attach photographs of closed lagoons. Also attach any additional information that supports closure of the facility.
  - Class II CAFOs must close waste storage structures in accordance with [10 CSR 20-6.300\(6\)\(B\)](#), or shall continue to maintain all storage structures so there is no discharge to waters of the state. Attach photographs of closed or re-purposed lagoons, or an explanation of “no discharge” methods. Also attach any additional information that supports closure of the facility.

**6. CERTIFICATION**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

NAME AND OFFICIAL TITLE (TYPE OR PRINT)	TELEPHONE NUMBER WITH AREA CODE
SIGNATURE	DATE SIGNED

**7. MAIL COMPLETED COPY TO:**

<p><b>For Site Specific (MO-), Abandoned Mine And Land Reclamation (MO-G05), Land Disturbance By County Or City (MO-R100), Pesticide Application (MO-G87), Sewer Extension Construction (MO-GC) and CAFO (MO-G01, MO-GS1) Permit Terminations:</b></p> <p>Missouri Department of Natural Resources                  Water Protection Program                  Water Pollution Control Branch                  Attn: Operating Permits Section                  P.O. Box 176                  Jefferson City, MO 65102-0176</p>	<p><b>For General Permit Terminations (MO-G or MO-R):</b></p> <p>Send to the appropriate regional office. Regional office is determined based on the county where the facility is physically located.</p> <p>To determine the correct regional office for the permitted facility, see <b><a href="http://dnr.mo.gov/regions">dnr.mo.gov/regions</a></b>.</p>
--	--

**FINAL STABILIZATION/TERMINATION CHECKLIST**

Mizzou North Demolition  
Columbia, Boone County, Missouri

- All soil disturbing activities are complete.
- All construction debris and trash has been removed.
- All paved surfaces onsite and in the surrounding area have been cleaned of all onsite sediment, trash, debris, etc.
- All Subcontractors have completed and cleaned up their work involving land disturbance/erosion and sediment control. The general contractor has inspected and approved this work.
- All temporary BMP's (such as silt fence) have been removed, finish graded, and seed and mulched. Residual sediment has been removed as needed. BMP's that will completely decompose, including some fiber rolls and blankets, may be left in place as approved by Operator.
- All areas where erosion-control blankets/mats were installed have been inspected. All loose, exposed blanket has been restapled/staked. If less than 70% blanket area is covered by vegetation, coordinate with Operator to determine solution.
- The project is stabilized. (The project is considered stabilized when perennial vegetation, pavement, buildings, or structures using permanent materials cover all areas that have been disturbed. Perennial vegetative cover shall be at least 70% of fully established plant density over 100% of the disturbed area.)
- All signs of erosion and sediment deposition have been repaired and are permanently stabilized.
- All permanent BMP's are in place and operational. Written maintenance requirements for all permanent BMP's have been provided to the Operator.
- All drainage conveyances and inlets/outlets have been installed per plan; all trash/debris has been removed, and are functioning as intended. All Inlet/outlet areas have been inspected to ensure complete stabilization in the surrounding area.
- All rip-rap areas are stable and rip-rap that has become dislodged has been replaced.

**CONTRACTOR'S CERTIFICATION:**

"I certify under penalty of law that all storm water discharges associated with Construction Activity from the identified project that are authorized by the NPDES General Operating Permit, have been eliminated, and that all disturbed areas and soils at the construction site have achieved final stabilization and all temporary erosion and sediment control measures have been removed or will be removed at a scheduled time coordinated with and approved by the Operator."

Name (Print) & Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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

Final Stabilization Date: \_\_\_\_\_

**APPENDIX P**

**TMDL DOCUMENTATION  
(303d IMPAIRED WATERWAY)**

Missouri Department of Natural Resources  
2020 Section 303(d) Listed Waters

Clean Water Commission Approved on April 2, 2020

Row #	Year	WBID	Waterbody	Class	Entire WB Imp'd	WB Size	Units	IU	Pollutant	Source	County Up/Down	HUC 8	Comment	TMDL Priority	TMDL Schedule Year
1	2012	<a href="#">2188.00</a>	Annie Cr.	P	Y	1.90	Miles	WBC B	Escherichia coli (W)	Nonpoint Source	St. Louis	07140102		H	2025
2	2018	<a href="#">2668.00</a>	Ashley Cr.	P	Y	2.50	Miles	WBC B	Escherichia coli (W)	Rural NPS	Dent	11010008		H	2025
3	2018	<a href="#">7637.00</a>	August A Busch Lake Number 36	UL	Y	16.00	Acres	GEN	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	St. Charles	07110009	4	L	> 10 years
4	2010	<a href="#">7627.00</a>	August A Busch Lake Number 37	L3	Y	30.00	Acres	GEN	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	St. Charles	07110009	4	L	> 10 years
5	2010	<a href="#">7339.00</a>	Austin Community Lake	L3	Y	21.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Texas	10290201	1	L	> 10 years
6	2016	<a href="#">4083.00</a>	Banker Creek tributary	C	Y	1.20	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Henry	10290108		L	> 10 years
7	2018	<a href="#">2693.00</a>	Barn Hollow	C	Y	8.20	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Howell/Texas	11010008		L	> 10 years
8	2012	<a href="#">0752.00</a>	Bass Cr.	C	Y	4.40	Miles	WBC A	Escherichia coli (W)	Rural NPS	Bouring	10300102		H	2023
9	2012	<a href="#">3240.00</a>	Baynham Br.	P	Y	4.00	Miles	WBC B	Escherichia coli (W)	Rural NPS	Newton	11070207	9	L	> 10 years
10	2014	<a href="#">3224.00</a>	Beef Br.	P	Y	2.50	Miles	AOL	Cadmium (S)	Mill Tailings	Newton	11070207		M	2026 - 2030
11	2014	<a href="#">3224.00</a>	Beef Br.	P	Y	2.50	Miles	AOL	Cadmium (W)	Mill Tailings	Newton	11070207		M	2026 - 2030
12	2014	<a href="#">3224.00</a>	Beef Br.	P	Y	2.50	Miles	AOL	Lead (S)	Mill Tailings	Newton	11070207		M	2026 - 2030
13	2014	<a href="#">3224.00</a>	Beef Br.	P	Y	2.50	Miles	AOL	Zinc (S)	Mill Tailings	Newton	11070207		M	2026 - 2030
14	2014	<a href="#">3224.00</a>	Beef Br.	P	Y	2.50	Miles	AOL	Zinc (W)	Mill Tailings	Newton	11070207		M	2026 - 2030
15	2014	<a href="#">7309.00</a>	Bee Tree Lake	L3	Y	10.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	St. Louis	07140102		L	> 10 years
16	2006	<a href="#">7365.00</a>	Bolcher Branch Lake	L3	Y	42.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Buchanan	10240012		L	> 10 years
17	2020	<a href="#">2179.00</a>	Bolton Cr.	P	Y	7.00	Miles	AOL	Oxygen, Dissolved (W)	Municipal Point Source Discharges, Source Unknown	Jefferson	07140104		L	> 10 years
18	2018	<a href="#">7186.00</a>	Ben Branch Lake	L3	Y	37.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Osage	10300102		L	> 10 years
19	2014	<a href="#">3980.00</a>	Bens Branch	C	Y	5.80	Miles	AOL	Cadmium (S)	Ononogo/Duerweg Mining Belt	Jasper	11070207		H	2022
20	2018	<a href="#">3980.00</a>	Bens Branch	C	Y	5.80	Miles	AOL	Cadmium (W)	Mill Tailings	Jasper	11070207		H	2022
21	2014	<a href="#">3980.00</a>	Bens Branch	C	Y	5.80	Miles	AOL	Lead (S)	Ononogo/Duerweg Mining Belt	Jasper	11070207		H	2022
22	2014	<a href="#">3980.00</a>	Bens Branch	C	Y	5.80	Miles	AOL	Zinc (S)	Ononogo/Duerweg Mining Belt	Jasper	11070207		H	2022
23	2016	<a href="#">3980.00</a>	Bens Branch	C	Y	5.80	Miles	AOL	Zinc (W)	Ononogo/Duerweg Mining Belt	Jasper	11070207		H	2022
24	2010	<a href="#">2916.00</a>	Big Cr.	P	N (1.8)	34.10	Miles	AOL	Cadmium (S)	Glover smelter	Iron	08020202	2	M	2026 - 2030
25	2010	<a href="#">1578.00</a>	Big Piney R.	P	N (4)	7.80	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Texas	10290202	2	M	2026 - 2030
26	2006	<a href="#">2080.00</a>	Big R.	P	N (52.8)	81.30	Miles	AOL	Cadmium (S)	Old Lead Belt tailings	St. Francois/Jefferson	07140104		H	2024
27	2012	<a href="#">2080.00</a>	Big R.	P	Y	81.30	Miles	AOL	Zinc (S)	Old Lead Belt tailings	St. Francois/Jefferson	07140104		H	2024
28	2020	<a href="#">7185.00</a>	Binder Lake	L3	Y	127.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Cole	10300102	1	L	> 10 years
29	2006	<a href="#">3184.00</a>	Blackberry Cr.	C	N (3.5)	6.50	Miles	AOL	Chloride (W)	Asbury Power Plant	Jasper	11070207		M	2026 - 2030
30	2008	<a href="#">3184.00</a>	Blackberry Cr.	C	N (3.5)	6.50	Miles	AOL	Sulfate + Chloride (W)	Asbury Power Plant	Jasper	11070207		M	2026 - 2030
31	2020	<a href="#">0112.00</a>	Black Cr.	C	Y	21.80	Miles	WBC B	Escherichia coli (W)	Nonpoint Source	Shelby	07110005		L	> 10 years
32	2006	<a href="#">3825.00</a>	Black Creek	P	Y	5.60	Miles	AOL	Chloride (W)	Urban Runoff/Storm Sewers	St. Louis	07140101		H	2025
33	2002	<a href="#">2769.00</a>	Black R.	P	Y	47.10	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Butler	11010007	2	L	> 10 years
34	2002	<a href="#">2784.00</a>	Black R.	P	Y	39.00	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Wayne/Butler	11010007	2	L	> 10 years
35	2020	<a href="#">7189.00</a>	Blind Pony Lake	L3	Y	96.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Saline	10300104	1	L	> 10 years
36	2006	<a href="#">0417.00</a>	Blue R.	P	Y	4.40	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jackson	10300101		H	2023
37	2006	<a href="#">0418.00</a>	Blue R.	P	Y	9.40	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jackson	10300101		H	2023
38	2006	<a href="#">0419.00</a>	Blue R.	P	Y	7.70	Miles	WBC A	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jackson	10300101		H	2023

Row #	Year	WBID	Waterbody	Class	Entire WB Imprd	WB Size	Units	IU	Pollutant	Source	County Up/Down	HUC 8	Comment	TMDL Priority	TMDL Schedule Year
39	2016	<a href="#">0417.00</a>	Blue R.	P	Y	4.40	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jackson	10300101		H	2023
40	2016	<a href="#">0418.00</a>	Blue R.	P	Y	9.40	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jackson	10300101		H	2023
41	2012	<a href="#">1701.00</a>	Bonhomme Cr.	C	Y	2.50	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	10300200		M	2026 - 2030
42	2006	<a href="#">0750.00</a>	Bonne Femme Cr.	P	Y	7.80	Miles	WBC A	Escherichia coli (W)	Rural NPS	Boone	10300102		H	2023
43	2012	<a href="#">0753.00</a>	Bonne Femme Cr.	C	Y	7.00	Miles	WBC B	Escherichia coli (W)	Rural NPS	Boone	10300102		H	2023
44	2002	<a href="#">2034.00</a>	Bourbouse R.	P	Y	136.70	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Phelps/Franklin	07140103	2	L	> 10 years
45	2014	<a href="#">2003.00</a>	Bowling Green Lake - Old	L1	Y	7.00	Acres	AOL	Chlorophyll-a (W)	Rural NPS	Pike	07100004	1 2 7	L	> 10 years
46	2012	<a href="#">2003.00</a>	Bowling Green Lake - Old	L1	Y	7.00	Acres	AOL	Nitrogen, Total (W)	Rural NPS	Pike	07110004	1 2 7	L	> 10 years
47	2012	<a href="#">2003.00</a>	Bowling Green Lake - Old	L1	Y	7.00	Acres	AOL	Phosphorus, Total (W)	Rural NPS	Pike	07100004	1 2 7	L	> 10 years
48	2012	<a href="#">1796.00</a>	Brazee Cr.	P	Y	10.80	Miles	WBC B	Escherichia coli (W)	Rural NPS	Perry	07140105		M	2026 - 2030
49	2002	<a href="#">1371.00</a>	Brush Cr.	P	Y	4.70	Miles	AOL	Oxygen, Dissolved (W)	Humansville WWTP	Polk/St. Clair	10290106		H	2020
50	2016	<a href="#">3986.00</a>	Brush Creek	C	Y	5.40	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jackson	10300101		H	2023
51	2016	<a href="#">3986.00</a>	Brush Creek	C	Y	5.40	Miles	AOL	Oxygen, Dissolved (W)	Nonpoint Source	Jackson	10300101		L	> 10 years
52	2016	<a href="#">7117.00</a>	Buffalo Bill Lake	L3	Y	45.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	DeKalb	10280101		L	> 10 years
53	2012	<a href="#">3273.00</a>	Buffalo Cr.	P	Y	8.00	Miles	AOL	Fishes Bioassessments/ Unknown (W)	Source Unknown	Newton/McDonald	11070208	5	M	2026 - 2030
54	2008	<a href="#">3118.00</a>	Buffalo Ditch	P	Y	17.30	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Drumlin	08020204		M	2026 - 2030
55	2006	<a href="#">1865.00</a>	Burgher Br.	C	Y	1.50	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Phelps	07140102		M	2026 - 2030
56	2018	<a href="#">3414.00</a>	Burr Oak Cr.	C	Y	6.80	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jackson	10300101		H	2024
57	2018	<a href="#">3414.00</a>	Burr Oak Cr.	C	Y	6.80	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jackson	10300101		H	2024
58	2020	<a href="#">3414.00</a>	Burr Oak Cr.	C	Y	6.80	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Jackson	10300101		L	> 10 years
59	2020	<a href="#">2056.00</a>	Busch W.A.- Kraut Run Lake	L3	Y	164.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	St. Charles	07110009	1	L	> 10 years
60	2006	<a href="#">2057.00</a>	Busch W.A. No. 35 Lake	L3	Y	51.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	St. Charles	07110009		L	> 10 years
61	2020	<a href="#">2229.00</a>	Butler Lake	L1	Y	71.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Bates	10290102	1 2	L	> 10 years
62	2006	<a href="#">2384.00</a>	Cameron Lake #4 (Grindstone Reservoir)	L1	Y	173.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	DeKalb	10280101	1 2	L	> 10 years
63	2006	<a href="#">3234.00</a>	Capps Cr.	P	Y	5.00	Miles	WBC A	Escherichia coli (W)	Rural NPS	Bates/Newton	11070207	9	L	> 10 years
64	2016	<a href="#">3241.00</a>	Carver Br.	P	Y	3.00	Miles	WBC A	Escherichia coli (W)	Rural NPS	Newton	11070207	9	L	> 10 years
65	2020	<a href="#">2374.00</a>	Catawba Lake	L3	Y	42.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Jackson	10290108	1	L	> 10 years
66	2008	<a href="#">1344.00</a>	Cedar Cr.	P	N (10.9)	31.00	Miles	AOL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Source Unknown	Cedar	10290106	5	M	2026 - 2030
67	2008	<a href="#">0737.00</a>	Cedar Cr.	C	N (7.9)	37.40	Miles	AOL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Source Unknown	Boone	10300102	5	M	2026 - 2030
68	2010	<a href="#">1357.00</a>	Cedar Cr.	C	Y	16.20	Miles	AOL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Source Unknown	DeKalb/Cedar	10290106	5	L	> 10 years
69	2016	<a href="#">1344.00</a>	Cedar Cr.	P	Y	31.00	Miles	WBC A	Escherichia coli (W)	Rural NPS	Cedar	10290106		H	2020
70	2008	<a href="#">1357.00</a>	Cedar Cr.	C	Y	16.20	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	DeKalb/Cedar	10290106		M	2026 - 2030
71	2010	<a href="#">1344.00</a>	Cedar Cr.	P	N (10.9)	31.00	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Cedar	10290106		M	2026 - 2030
72	2006	<a href="#">3203.00</a>	Center Cr.	P	N (19)	26.80	Miles	AOL	Cadmium (S)	Tri-State Mining District	Jasper	11070207		H	2022
73	2008	<a href="#">3210.00</a>	Center Cr.	P	Y	21.00	Miles	WBC A	Escherichia coli (W)	Rural NPS	Newton/Jasper	11070207	9	L	> 10 years
74	2010	<a href="#">3214.00</a>	Center Cr.	P	Y	4.90	Miles	WBC A	Escherichia coli (W)	Rural NPS	Lawrence/Newton	11070207	9	L	> 10 years
75	2006	<a href="#">3203.00</a>	Center Cr.	P	N (19)	26.80	Miles	AOL	Lead (S)	Tri-State Mining District	Jasper	11070207		H	2022
76	2016	<a href="#">5003.00</a>	Center Creek tributary	C	Y	2.70	Miles	AOL	Cadmium (W)	Onongos/Duenweg Mining Belt	Jasper	11070207		H	2022
77	2020	<a href="#">5003.00</a>	Center Creek tributary	C	Y	2.70	Miles	AOL	Lead (W)	Mill Tailings	Jasper	11070207		H	2022
78	2016	<a href="#">5003.00</a>	Center Creek tributary	C	Y	2.70	Miles	AOL	Zinc (W)	Onongos/Duenweg Mining Belt	Jasper	11070207		H	2022
79	2014	<a href="#">2634.00</a>	Chamniere Lake	UL	Y	3.40	Acres	GEN	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Clay	10300101	4	M	2026 - 2030
80	2012	<a href="#">1781.00</a>	Cinque Hommes Cr.	P	Y	17.10	Miles	WBC B	Escherichia coli (W)	Rural NPS	Perry	07140105		M	2026 - 2030



Row #	Year	WBID	Waterbody	Class	Entire WB Imprd	WB Size	Units	IU	Pollutant	Source	County Up/Down	HUC 8	Comment	TMDL Priority	TMDL Schedule Year
81	2016	<a href="#">1781.00</a>	Claque Hommes Cr.	P	Y	17.10	Miles	SCR	Escherichia coli (W)	Rural NPS	<a href="#">Perry</a>	07140105		M	2026 - 2030
82	2018	<a href="#">1000.00</a>	Clark Fk.	C	Y	6.00	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	<a href="#">Cole</a>	10300102		L	> 10 years
83	2006	<a href="#">3238.00</a>	Cleat Cr.	P	Y	11.10	Miles	WBC B	Escherichia coli (W)	Rural NPS	<a href="#">Lawrence/Newton</a>	11070207	9	L	> 10 years
84	2002	<a href="#">3239.00</a>	Cleat Cr.	C	Y	3.50	Miles	AOL	Nutrient/Eutrophication Biol. Indicators (W)	Monett WWTP	<a href="#">Burr/Lawrence</a>	11070207	1	H	2020
85	2002	<a href="#">3239.00</a>	Cleat Cr.	C	Y	3.50	Miles	AOL	Oxygen, Dissolved (W)	Monett WWTP	<a href="#">Burr/Lawrence</a>	11070207		H	2020
86	2006	<a href="#">1333.00</a>	Clear Cr.	P	Y	28.20	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	<a href="#">Vernon/St. Clair</a>	10290105		M	2026 - 2030
87	2006	<a href="#">0935.00</a>	Clear Fk.	P	N (3.1)	25.80	Miles	AOL	Oxygen, Dissolved (W)	Knob Noster WWTP	<a href="#">Johnson</a>	10300104		H	2025
88	2014	<a href="#">7326.00</a>	Clearwater Lake	L2	Y	1635.00	Acres	AOL	Chlorophyll-a (W)	Rural NPS	<a href="#">Reynolds/Wayne</a>	11010007	1.7	L	> 10 years
89	2002	<a href="#">7326.00</a>	Clearwater Lake	L2	Y	1635.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	<a href="#">Reynolds/Wayne</a>	11010007	7	L	> 10 years
90	2016	<a href="#">7326.00</a>	Clearwater Lake	L2	Y	1635.00	Acres	AOL	Phosphorus, Total (W)	Nonpoint Source	<a href="#">Reynolds/Wayne</a>	11010007	1.7	L	> 10 years
91	2006	<a href="#">1706.00</a>	Coldwater Cr.	C	Y	6.90	Miles	AOL	Chloride (W)	Urban Runoff/Storm Sewers	<a href="#">St. Louis</a>	10300200		H	2025
92	2020	<a href="#">7178.00</a>	Coot Lake	L3	Y	20.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	<a href="#">Jackson</a>	10290108	1	L	> 10 years
93	2016	<a href="#">7178.00</a>	Coot Lake	L3	Y	20.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	<a href="#">Jackson</a>	10290108		L	> 10 years
94	2016	<a href="#">7379.00</a>	Cottontail Lake	L3	Y	22.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	<a href="#">Jackson</a>	10290108		L	> 10 years
95	2020	<a href="#">3062.00</a>	Crackerneck Creek	C	Y	6.00	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	<a href="#">Jackson</a>	10300101		L	> 10 years
96	2012	<a href="#">2382.00</a>	Crane Cr.	P	Y	13.20	Miles	AOL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Source Unknown	<a href="#">Stone</a>	11010002	5	M	2026 - 2030
97	2016	<a href="#">7334.00</a>	Crane Lake	L3	Y	109.00	Acres	AOL	Chlorophyll-a (W)	Source Unknown	<a href="#">Iron</a>	08020202	1.7	L	> 10 years
98	2016	<a href="#">7334.00</a>	Crane Lake	L3	Y	109.00	Acres	AOL	Phosphorus, Total (W)	Source Unknown	<a href="#">Iron</a>	08020202	1.7	L	> 10 years
99	2012	<a href="#">2816.00</a>	Craven Ditch	C	Y	11.60	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	<a href="#">Butler</a>	11010007		L	> 10 years
100	2006	<a href="#">1703.00</a>	Creve Coeur Cr.	C	Y	3.80	Miles	AOL	Chloride (W)	Urban Runoff/Storm Sewers	<a href="#">St. Louis</a>	10300200		H	2025
101	2008	<a href="#">3961.00</a>	Crooked Creek	C	Y	6.50	Miles	AOL	Cadmium (W)	Back Lead Smelter	<a href="#">Iron/Crawford</a>	07140102		M	2026 - 2030
102	2010	<a href="#">3961.00</a>	Crooked Creek	C	Y	6.50	Miles	AOL	Copper (W)	Back Lead Smelter	<a href="#">Iron/Crawford</a>	07140102		M	2026 - 2030
103	2016	<a href="#">7135.00</a>	Crowder St. Park Lake	L3	Y	18.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	<a href="#">Grundy</a>	10280102		L	> 10 years
104	2020	<a href="#">0152.00</a>	Cuivre R.	P	Y	30.00	Miles	WBC A	Escherichia coli (W)	Nonpoint Source	<a href="#">Lincoln/St. Charles</a>	07110008		L	> 10 years
105	2006	<a href="#">2636.00</a>	Current R.	P	Y	124.00	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	<a href="#">Shannon/Epley</a>	11010008		L	> 10 years
106	2018	<a href="#">2662.00</a>	Current R.	P	Y	18.80	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	<a href="#">Demi/Shannon</a>	11010008		L	> 10 years
107	2018	<a href="#">0221.00</a>	Dardenne Cr.	P	Y	16.50	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	<a href="#">St. Charles</a>	07110009		M	2026 - 2030
108	2020	<a href="#">0222.00</a>	Dardenne Cr.	C	Y	8.50	Miles	WBC B	Escherichia coli (W)	Urban Runoff and Nonpoint Source	<a href="#">St. Charles</a>	07110009		L	> 10 years
109	2006	<a href="#">0219.00</a>	Dardenne Cr.	P1	Y	7.00	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	<a href="#">St. Charles</a>	07110009		M	2026 - 2030
110	2006	<a href="#">3826.00</a>	Deer Creek	P	Y	1.60	Miles	AOL	Chloride (W)	Urban Runoff/Storm Sewers	<a href="#">St. Louis/St. Louis City</a>	07140101		H	2025
111	2002	<a href="#">7015.00</a>	Deer Ridge Community Lake	L3	Y	39.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	<a href="#">Leavis</a>	07110002		L	> 10 years
112	2020	<a href="#">7331.00</a>	Disalvo Lake	L3	Y	210.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	<a href="#">St. Francois</a>	08020202	1	L	> 10 years
113	2006	<a href="#">3109.00</a>	Ditch #36	P	Y	7.80	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	<a href="#">Dunklin</a>	08020204		M	2026 - 2030
114	2006	<a href="#">3810.00</a>	Douger Br.	C	Y	2.80	Miles	AOL	Lead (S)	Aurora Lead Mining District	<a href="#">Lawrence</a>	11070207		M	2026 - 2030
115	2006	<a href="#">3810.00</a>	Douger Br.	C	Y	2.80	Miles	AOL	Zinc (S)	Aurora Lead Mining District	<a href="#">Lawrence</a>	11070207		M	2026 - 2030
116	2020	<a href="#">7228.00</a>	Drexel Lake	L1	Y	28.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	<a href="#">Bates</a>	10290102	1.2	L	> 10 years
117	2008	<a href="#">3189.00</a>	Dry Fk.	C	Y	10.20	Miles	WBC A	Escherichia coli (W)	Rural NPS	<a href="#">Jasper</a>	11070207	9	L	> 10 years
118	2016	<a href="#">1792.00</a>	Dry Fk.	C	Y	3.20	Miles	WBC B	Escherichia coli (W)	Source Unknown	<a href="#">Perry</a>	07140105		M	2026 - 2030
119	2016	<a href="#">3163.00</a>	Dry Hollow	C	Y	0.50	Miles	SCR	Escherichia coli (W)	Source Unknown	<a href="#">Lawrence</a>	11070207		M	2026 - 2030
120	2016	<a href="#">3570.00</a>	Duro Carter Cr.	C	Y	0.50	Miles	SCR	Escherichia coli (W)	Source Unknown	<a href="#">Pheias</a>	07140102		M	2026 - 2030
121	2016	<a href="#">3570.00</a>	Duro Carter Cr.	C	Y	0.50	Miles	WBC B	Escherichia coli (W)	Source Unknown	<a href="#">Pheias</a>	07140102		M	2026 - 2030
122	2006	<a href="#">3569.00</a>	Duro Carter Cr.	P	N (0.5)	1.50	Miles	AOL	Oxygen, Dissolved (W)	Rolla SE WWTP	<a href="#">Pheias</a>	07140102		M	2026 - 2030

Row #	Year	WBID	Waterbody	Class	Entire WB Impdr	WB Size	Units	IU	Pollutant	Source	County Up/Down	HUC 8	Comment	TMDL Priority	TMDL Schedule Year
123	2016	<a href="#">3199.00</a>	Duval Cr.	C	Y	7.00	Miles	WBC B	Escherichia coli (W)	Nonpoint Source	<a href="#">Ingrae</a>	11070207	9	L	> 10 years
124	2006	<a href="#">2166.00</a>	Eaton Br.	C	Y	1.20	Miles	AOL	Cadmium (S)	Leadwood tailings pond	<a href="#">St. Francois</a>	07140104		H	2024
125	2006	<a href="#">2166.00</a>	Eaton Br.	C	Y	1.20	Miles	AOL	Cadmium (W)	Leadwood tailings pond	<a href="#">St. Francois</a>	07140104		H	2024
126	2006	<a href="#">2166.00</a>	Eaton Br.	C	Y	1.20	Miles	AOL	Lead (S)	Leadwood tailings pond	<a href="#">St. Francois</a>	07140104		H	2024
127	2018	<a href="#">2166.00</a>	Eaton Br.	C	Y	1.20	Miles	AOL	Lead (W)	Leadwood tailings pond	<a href="#">St. Francois</a>	07140104		H	2024
128	2006	<a href="#">2166.00</a>	Eaton Br.	C	Y	1.20	Miles	AOL	Zinc (S)	Leadwood tailings pond	<a href="#">St. Francois</a>	07140104		H	2024
129	2006	<a href="#">2166.00</a>	Eaton Br.	C	Y	1.20	Miles	AOL	Zinc (W)	Leadwood tailings pond	<a href="#">St. Francois</a>	07140104		H	2024
130	2020	<a href="#">2026.00</a>	<b>Edina Reservoir</b>	L1	Y	<b>51.00</b>	<b>Acres</b>	AOL	<b>Chlorophyll-a (W)</b>	<b>Nonpoint Source</b>	<a href="#">Knox</a>	<b>07110003</b>	<b>1 2</b>	L	> 10 years
131	2020	<a href="#">2192.00</a>	<b>Edwin A. Pape Lake</b>	L1	Y	<b>272.50</b>	<b>Acres</b>	AOL	<b>Chlorophyll-a (W)</b>	<b>Nonpoint Source</b>	<a href="#">Lafayette</a>	<b>10300104</b>	<b>1 2</b>	L	> 10 years
132	2010	<a href="#">0372.00</a>	E. Fk. Crooked R.	P	Y	19.90	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	<a href="#">Ray</a>	10300101		M	2026 - 2030
133	2006	<a href="#">0457.00</a>	E. Fk. Grand R.	P	Y	28.70	Miles	WBC A	Escherichia coli (W)	Rural NPS	<a href="#">Warrior/Gentry</a>	10280101	2	H	2020
134	2020	<a href="#">0428.00</a>	<b>E. Fk. L. Blue R.</b>	C	N (2,6)	<b>3.70</b>	<b>Miles</b>	AOL	<b>Oxygen, Dissolved (W)</b>	<b>Source Unknown</b>	<a href="#">Jackson</a>	<b>10300101</b>		L	> 10 years
135	2020	<a href="#">0610.00</a>	<b>E. Fk. Locust Cr.</b>	C	Y	<b>15.70</b>	<b>Miles</b>	AOL	<b>Chloride (W)</b>	<b>Industrial Point Source Discharge</b>	<a href="#">Sullivan</a>	<b>10280103</b>		L	> 10 years
136	2008	<a href="#">0608.00</a>	E. Fk. Locust Cr.	P	Y	16.70	Miles	WBC B	Escherichia coli (W)	Milan Lagoon and Nonpoint Source	<a href="#">Sullivan</a>	10280103		H	2025
137	2008	<a href="#">0610.00</a>	E. Fk. Locust Cr.	C	Y	15.70	Miles	WBC A	Escherichia coli (W)	Rural NPS	<a href="#">Sullivan</a>	10280103		H	2025
138	2018	<a href="#">0608.00</a>	E. Fk. Locust Cr.	P	Y	16.70	Miles	SCR	Escherichia coli (W)	Milan Lagoon and Nonpoint Source	<a href="#">Sullivan</a>	10280103		H	2025
139	2018	<a href="#">1282.00</a>	E. Fk. Tebo Cr.	C	Y	14.50	Miles	AOL	Ammonia, Total (W)	Municipal Point Source Discharges	<a href="#">Henry</a>	10290108		L	> 10 years
140	2006	<a href="#">1282.00</a>	E. Fk. Tebo Cr.	C	N (10,4)	14.50	Miles	AOL	Oxygen, Dissolved (W)	Windsor SW WWTP	<a href="#">Henry</a>	10290108		M	2026 - 2030
141	2002	<a href="#">2593.00</a>	Eleven Point R.	P	Y	22.70	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	<a href="#">Oregon</a>	11010011		L	> 10 years
142	2006	<a href="#">2597.00</a>	Eleven Point R.	P	Y	11.40	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	<a href="#">Oregon</a>	11010011		L	> 10 years
143	2008	<a href="#">2601.00</a>	Eleven Point R.	P	Y	22.30	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	<a href="#">Oregon</a>	11010011		L	> 10 years
144	2002	<a href="#">0189.00</a>	Elkhorn Cr.	C	N (17,6)	21.40	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	<a href="#">Montgomery</a>	07110008		M	2026 - 2030
145	2020	<a href="#">2011.00</a>	<b>Ella Ewing Community Lake</b>	L3	Y	<b>15.00</b>	<b>Acres</b>	AOL	<b>Chlorophyll-a (W)</b>	<b>Nonpoint Source</b>	<a href="#">Scotland</a>	<b>07110008</b>	<b>1</b>	L	> 10 years
146	2006	<a href="#">1283.00</a>	Elm Br.	C	Y	3.00	Miles	AOL	Oxygen, Dissolved (W)	Windsor SE WWTP	<a href="#">Henry</a>	10290108		M	2026 - 2030
147	2018	<a href="#">4110.00</a>	Engelholm Creek	C	Y	3.00	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	<a href="#">St. Louis</a>	07140101		L	> 10 years
148	2018	<a href="#">4110.00</a>	Engelholm Creek	C	Y	3.00	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	<a href="#">St. Louis</a>	07140101		L	> 10 years
149	2012	<a href="#">1704.00</a>	Fee Fee Cr. (new)	P	Y	1.50	Miles	AOL	Chloride (W)	Urban Runoff/Storm Sewers	<a href="#">St. Louis</a>	10300200		M	2026 - 2030
150	2012	<a href="#">1704.00</a>	Fee Fee Cr. (new)	P	Y	1.50	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	<a href="#">St. Louis</a>	10300200		M	2026 - 2030
151	2012	<a href="#">2237.00</a>	Fellows Lake	L1	Y	800.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	<a href="#">Greene</a>	10290106	2	L	> 10 years
152	2016	<a href="#">3595.00</a>	Fenton Cr.	P	Y	0.50	Miles	AOL	Chloride (W)	Source Unknown	<a href="#">St. Louis</a>	07140102		M	2026 - 2030
153	2012	<a href="#">3595.00</a>	Fenton Cr.	P	Y	0.50	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	<a href="#">St. Louis</a>	07140102		M	2026 - 2030
154	2012	<a href="#">2186.00</a>	Fishpot Cr.	P	Y	3.50	Miles	AOL	Chloride (W)	Urban Runoff/Storm Sewers	<a href="#">St. Louis</a>	07140102		M	2026 - 2030
155	2016	<a href="#">3220.00</a>	Fivemile Cr.	P	N (4,9)	5.00	Miles	WBC B	Escherichia coli (W)	Rural NPS	<a href="#">Newton</a>	11070207	9	L	> 10 years
156	2016	<a href="#">0864.00</a>	Flat Cr.	P	Y	23.70	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	<a href="#">Pemis/Morgan</a>	10300103		L	> 10 years
157	2006	<a href="#">2168.00</a>	Flat River Cr.	C	N (4,7)	10.00	Miles	AOL	Cadmium (W)	Old Lead Belt tailings	<a href="#">St. Francois</a>	07140104		H	2024
158	2012	<a href="#">3038.00</a>	Flat River tributary	US	Y	0.30	Miles	GEN	Zinc (W)	Elkins Chat Pile	<a href="#">St. Francois</a>	07140104	4	H	2024
159	2020	<a href="#">3587.00</a>	<b>Fleck Cr.</b>	C	Y	<b>4.30</b>	<b>Miles</b>	AOL	<b>Sulfate + Chloride (W)</b>	<b>Coal Mining</b>	<a href="#">Barren</a>	<b>10290104</b>		L	> 10 years
160	2010	<a href="#">2151.00</a>	Forest Lake	L1	Y	580.00	Acres	AOL	Chlorophyll-a (W)	Rural NPS	<a href="#">Adair</a>	10280202	1 2 7	L	> 10 years
161	2016	<a href="#">2151.00</a>	Forest Lake	L1	Y	580.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	<a href="#">Adair</a>	10280202	2 7	L	> 10 years
162	2016	<a href="#">3943.00</a>	Foster Branch tributary	C	N (0,2)	2.00	Miles	AOL	Oxygen, Dissolved (W)	Ashland WWTP	<a href="#">Boone</a>	10300102		M	2026 - 2030
163	2018	<a href="#">2324.00</a>	Fourche Lake	L3	Y	49.00	Acres	AOL	Chlorophyll-a (W)	Source Unknown	<a href="#">Ripley</a>	11010009	1 7	L	> 10 years
164	2018	<a href="#">2324.00</a>	Fourche Lake	L3	Y	49.00	Acres	AOL	Nitrogen, Total (W)	Source Unknown	<a href="#">Ripley</a>	11010009	1 7	L	> 10 years
165	2006	<a href="#">0747.00</a>	Fowler Cr.	C	Y	6.00	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	<a href="#">Boone</a>	10300102		M	2026 - 2030

Row #	Year	WBID	Waterbody	Class	Entire WB Impdr	WB Size	Units	IU	Pollutant	Source	County Up/Down	HUC 8	Comment	TMDL Priority	TMDL Schedule Year
166	2010	<a href="#">7382.00</a>	Foxboro Lake	L3	Y	22.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics		07140103		L	> 10 years
167	2008	<a href="#">9038.00</a>	Fox R.	P	Y	42.00	Miles	WBC B	Escherichia coli (W)	Rural NPS	Clark	07110001		M	2026 - 2030
168	2014	<a href="#">7008.00</a>	Fox Valley Lake	L3	Y	89.00	Acres	AOL	Chlorophyll-a (W)	Rural NPS	Clark	07110001	1.7	L	> 10 years
169	2014	<a href="#">7008.00</a>	Fox Valley Lake	L3	Y	89.00	Acres	AOL	Nitrogen, Total (W)	Rural NPS	Clark	07110001	1.7	L	> 10 years
170	2010	<a href="#">7008.00</a>	Fox Valley Lake	L3	Y	89.00	Acres	AOL	Phosphorus, Total (W)	Rural NPS	Clark	07110001	1.7	L	> 10 years
171	2020	<a href="#">7328.00</a>	Fredericktown City Lake	L1	Y	80.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Madison	08020202	1.2	L	> 10 years
172	2002	<a href="#">7280.00</a>	Frisco Lake	L3	Y	5.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Phelps	07140102		L	> 10 years
173	2016	<a href="#">4061.00</a>	Gailey Branch	C	Y	3.20	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Plke	07110007		M	2026 - 2030
174	2012	<a href="#">1004.00</a>	Gains Cr.	C	Y	5.50	Miles	WBC A	Escherichia coli (W)	Rural NPS	Boone	10300102		M	2026 - 2030
175	2020	<a href="#">7426.00</a>	Garden City New Lake	L1	Y	39.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Cass	10290108	1.2	L	> 10 years
176	2002	<a href="#">1455.00</a>	Gassonade R.	P	Y	264.00	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Pulaski	10290203	2	L	> 10 years
177	2006	<a href="#">2184.00</a>	Grand Glaize Cr.	C	Y	4.00	Miles	AOL	Chloride (W)	Urban Runoff/Storm Sewers	St. Louis	07140102		H	2025
178	2008	<a href="#">2184.00</a>	Grand Glaize Cr.	C	Y	4.00	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140102		M	2026 - 2030
179	2002	<a href="#">2184.00</a>	Grand Glaize Cr.	C	Y	4.00	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	St. Louis	07140102		L	> 10 years
180	2006	<a href="#">0593.00</a>	Grand R.	P	Y	56.00	Miles	WBC A	Escherichia coli (W)	Rural NPS	Livingston/Chariton	10280103	2	M	2026 - 2030
181	2006	<a href="#">1713.00</a>	Gravois Creek	C	Y	10.70	Miles	AOL	Chloride (W)	Urban Runoff/Storm Sewers	St. Louis	07140101		H	2025
182	2008	<a href="#">1712.00</a>	Gravois Creek	P	Y	2.30	Miles	AOL	Chloride (W)	Urban Runoff/Storm Sewers	St. Louis/St. Louis City	07140101		M	2026 - 2030
183	2016	<a href="#">4051.00</a>	Gravois Creek tributary	C	Y	1.90	Miles	WBC B	Escherichia coli (W)	Municipal, Urbanized High Density Area, Urban Runoff/Storm Sewers	St. Louis	07140101		L	> 10 years
184	2020	<a href="#">7161.00</a>	Green City Lake	L1	Y	57.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Sullivan	10280202	1.2	L	> 10 years
185	2006	<a href="#">1009.00</a>	Grindstone Cr.	C	Y	2.50	Miles	WBC A	Escherichia coli (W)	Rural NPS	Boone	10300102		M	2026 - 2030
186	2020	<a href="#">7385.00</a>	Harmony Mission Lake	L3	Y	96.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Bates	10290103	1	L	> 10 years
187	2020	<a href="#">7386.00</a>	Harrison County Lake	L1	Y	280.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Harrison	10280101	1.2	L	> 10 years
188	2014	<a href="#">2386.00</a>	Harrison County Lake	L1	Y	280.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Harrison	10280101	2	L	> 10 years
189	2020	<a href="#">7214.00</a>	Harrisonville City Lake	L1	Y	419.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Cass	10290108	1.2	L	> 10 years
190	2010	<a href="#">7152.00</a>	Hazel Creek Lake	L1	Y	518.00	Acres	AOL	Chlorophyll-a (W)	Rural NPS	Adair	10280201	1.2.7	L	> 10 years
191	2018	<a href="#">7152.00</a>	Hazel Creek Lake	L1	Y	518.00	Acres	AOL	Nitrogen, Total (W)	Nonpoint Source	Adair	10280201	1.2.7	L	> 10 years
192	2020	<a href="#">7387.00</a>	Hazel Hill Lake	L3	Y	62.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Johnson	10300104	1	L	> 10 years
193	2016	<a href="#">2196.00</a>	Headwater Div. Chan.	P	Y	20.30	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Cape Girardeau	07140105	2	L	> 10 years
194	2008	<a href="#">0848.00</a>	Heaths Cr.	P	Y	21.00	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Pettis/Capegr	10300103		M	2026 - 2030
195	2006	<a href="#">3226.00</a>	Hickory Cr.	P	Y	4.90	Miles	WBC A	Escherichia coli (W)	Rural NPS	Newton	11070207	9	L	> 10 years
196	2020	<a href="#">7190.00</a>	Higginsville Reservoir (South)	L1	Y	147.10	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Lafayette	10300104	1.2	L	> 10 years
197	2012	<a href="#">1008.00</a>	Hinkson Cr.	C	Y	18.80	Miles	WBC A	Escherichia coli (W)	Nonpoint Source	Boone	10300102		M	2026 - 2030
198	2016	<a href="#">1007.00</a>	Hinkson Cr.	P	Y	7.60	Miles	WBC B	Escherichia coli (W)	Nonpoint Source	Boone	10300102		M	2026 - 2030
199	2016	<a href="#">7193.00</a>	Holden City Lake	L1	Y	290.20	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Johnson	10300104	2	L	> 10 years
200	2012	<a href="#">1011.00</a>	Honny Br.	C	Y	1.00	Miles	WBC B	Escherichia coli (W)	Rural NPS	Boone	10300102		M	2026 - 2030
201	2010	<a href="#">3169.00</a>	Honey Cr.	P	Y	16.50	Miles	WBC B	Escherichia coli (W)	Rural NPS	Lawrence	11070207	9	L	> 10 years
202	2010	<a href="#">3170.00</a>	Honey Cr.	C	Y	2.70	Miles	WBC B	Escherichia coli (W)	Rural NPS	Lawrence	11070207	9	L	> 10 years
203	2018	<a href="#">1251.00</a>	Honey Cr.	C	Y	8.50	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Henry	10290108		L	> 10 years
204	2010	<a href="#">1348.00</a>	Horse Cr.	P	Y	27.70	Miles	AOL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Source Unknown	Yemmon/Cedar	10290106	5	L	> 10 years
205	2008	<a href="#">1348.00</a>	Horse Cr.	P	Y	27.70	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Yemmon/Cedar	10290106		M	2026 - 2030
206	2014	<a href="#">3413.00</a>	Horseshoe Cr.	C	Y	5.80	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Lafayette/Jackson	10300101		M	2026 - 2030
207	2002	<a href="#">7388.00</a>	Hough Park Lake	L3	Y	10.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Cole	10300102		L	> 10 years
208	2020	<a href="#">7029.00</a>	Hunnewell Lake	L3	Y	228.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Shelby	07110004	1.8	L	> 10 years

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209	2012	<a href="#">7029.00</a>	Humwell Lake	L3	Y	228.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Shelby	07110004		L	> 10 years
210	2010	<a href="#">0420.00</a>	Indian Cr.	C	Y	3.40	Miles	AOL	Chloride (W)	Road/Bridge Runoff, Non-construction	Jackson	10300101		M	2026 - 2030
211	2002	<a href="#">0420.00</a>	Indian Cr.	C	Y	3.40	Miles	WBC A	Escherichia coli (W)	Lenwood, KS WWTP	Jackson	10300101		H	2023
212	2008	<a href="#">7389.00</a>	Indian Creek Community Lake	L3	Y	185.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Livingston	10280101		L	> 10 years
213	2014	<a href="#">3223.00</a>	Jacobs Br.	P	Y	1.60	Miles	AOL	Cadmium (S)	Tri-State Mining District	Newton	11070207		M	2026 - 2030
214	2014	<a href="#">3223.00</a>	Jacobs Br.	P	Y	1.60	Miles	AOL	Cadmium (W)	Tri-State Mining District	Newton	11070207		M	2026 - 2030
215	2014	<a href="#">3223.00</a>	Jacobs Br.	P	Y	1.60	Miles	AOL	Lead (S)	Tri-State Mining District	Newton	11070207		M	2026 - 2030
216	2014	<a href="#">3223.00</a>	Jacobs Br.	P	Y	1.60	Miles	AOL	Zinc (S)	Tri-State Mining District	Newton	11070207		M	2026 - 2030
217	2012	<a href="#">3223.00</a>	Jacobs Br.	P	Y	1.60	Miles	AOL	Zinc (W)	Tri-State Mining District	Newton	11070207		M	2026 - 2030
218	2020	<a href="#">2365.00</a>	James R.	P	Y	39.00	Miles	WBC A	Escherichia coli (W)	Source Unknown	Greene	11010002	2	L	> 10 years
219	2012	<a href="#">3207.00</a>	Jenkins Cr.	P	Y	2.80	Miles	WBC A	Escherichia coli (W)	Rural NPS	Jasper	11070207	9	L	> 10 years
220	2014	<a href="#">3208.00</a>	Jenkins Cr.	C	Y	4.80	Miles	WBC A	Escherichia coli (W)	Rural NPS	Newtown/Jasper	11070207	9	L	> 10 years
221	2012	<a href="#">3205.00</a>	Jones Cr.	P	Y	7.50	Miles	WBC A	Escherichia coli (W)	Rural NPS	Newtown/Jasper	11070207	9	L	> 10 years
222	2016	<a href="#">5006.00</a>	Joplin Creek	C	Y	3.90	Miles	AOL	Cadmium (W)	Mill Tailings	Jasper	11070207		L	> 10 years
223	2018	<a href="#">5006.00</a>	Joplin Creek	C	Y	3.90	Miles	AOL	Zinc (W)	Mill Tailings	Jasper	11070207		L	> 10 years
224	2014	<a href="#">3374.00</a>	Jordan Cr.	P	Y	3.80	Miles	AOL	Polycyclic Aromatic Hydrocarbons-PAHs (S)	Urban NPS	Greene	11010002		L	> 10 years
225	2012	<a href="#">3592.00</a>	Keller Cr.	P	Y	1.20	Miles	WBC A	Escherichia coli (W)	Rural NPS	St. Louis	07140102		M	2026 - 2030
226	2016	<a href="#">7657.00</a>	Knox Village Lake	L3	Y	3.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Jackson	10300101		L	> 10 years
227	2016	<a href="#">2171.00</a>	Koen Cr.	C	Y	1.00	Miles	AOL	Lead (S)	Mine Tailings	St. Francois	07140104		H	2024
228	2020	<a href="#">2023.00</a>	Labelle Lake #2	L1	Y	98.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Lewis	07100003	1 2	L	> 10 years
229	2016	<a href="#">2023.00</a>	Labelle Lake #2	L1	Y	98.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Lewis	07100003	2	L	> 10 years
230	2010	<a href="#">2997.00</a>	Lac Capri	L3	Y	106.00	Acres	AOL	Nitrogen, Total (W)	Rural, Residential Areas	St. Francois	07140104	1 6 7	L	> 10 years
231	2016	<a href="#">7659.00</a>	Lake Boutin	L3	Y	20.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Cape Girardeau	07140105		L	> 10 years
232	2002	<a href="#">7469.00</a>	Lake Buteo	L3	Y	7.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Johnson	10300104		L	> 10 years
233	2020	<a href="#">7311.00</a>	Lake Girardeau	L3	Y	144.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Cape Girardeau	07140107	1	L	> 10 years
234	2020	<a href="#">7332.00</a>	Lake Killarney	L3	Y	61.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Iron	08020202	1	L	> 10 years
235	2018	<a href="#">7049.00</a>	Lake Lincoln	L3	Y	88.00	Acres	AOL	Chlorophyll-a (W)	Source Unknown	Lincoln	07110008	1 7	L	> 10 years
236	2002	<a href="#">7436.00</a>	Lake of the Woods	L3	Y	3.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Boone	10300102		L	> 10 years
237	2008	<a href="#">7629.00</a>	Lake of the Woods	UL	Y	7.00	Acres	GEN	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Jackson	10300101	4	L	> 10 years
238	2016	<a href="#">7132.00</a>	Lake Paho	L3	Y	273.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Merger	10280102		L	> 10 years
239	2020	<a href="#">7312.00</a>	Lake Springfield	L3	Y	293.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Greene	11010002	1	L	> 10 years
240	2014	<a href="#">7055.00</a>	Lake St. Louis	L3	Y	71.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	St. Charles	07110009		L	> 10 years
241	2020	<a href="#">7054.00</a>	Lake St. Louis	L3	Y	444.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	St. Charles	07110009	1	L	> 10 years
242	2016	<a href="#">7035.00</a>	Lake Tom Sawyer	L3	Y	4.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Monroe	07110006		L	> 10 years
243	2020	<a href="#">7341.00</a>	Lake Tywappity	L3	Y	43.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Scott	08020204	1	L	> 10 years
244	2020	<a href="#">7336.00</a>	Lake Wappapello	L2	Y	7827.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Wauke	08020202	1	L	> 10 years
245	2010	<a href="#">7212.00</a>	Lake Winnebago	L3	Y	272.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Cass	10290108		L	> 10 years
246	2006	<a href="#">0847.00</a>	Lamine R.	P	Y	64.00	Miles	WBC A	Escherichia coli (W)	Rural NPS	Morgan/Coeper	10300103		H	2023
247	2018	<a href="#">3105.00</a>	Lateral #2 Main Ditch	P	Y	11.50	Miles	AOL	Ammonia, Total (W)	Source Unknown	Stockdale	08020204		L	> 10 years
248	2006	<a href="#">3105.00</a>	Lateral #2 Main Ditch	P	Y	11.50	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Stockdale	08020204		M	2026 - 2030
249	2014	<a href="#">1529.00</a>	L. Beaver Cr.	C	Y	3.50	Miles	WBC A	Escherichia coli (W)	Source Unknown	Pelhus	10290203		M	2026 - 2030

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250	2008	<a href="#">1529.00</a>	L. Beaver Cr.	C	Y	3.50	Miles	AOL	Sedimentation/Siltation (S)	Smith Sand and Gravel	<a href="#">Phebus</a>	10290203		M	2026 - 2030
251	2012	<a href="#">0422.00</a>	L. Blue R.	P	Y	35.10	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	<a href="#">Jackson</a>	10300101		H	2024
252	2018	<a href="#">0422.00</a>	L. Blue R.	P	Y	35.10	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	<a href="#">Jackson</a>	10300101		H	2024
253	2012	<a href="#">1003.00</a>	L. Boone Femme Cr.	P	Y	9.00	Miles	WBC B	Escherichia coli (W)	Source Unknown	<a href="#">Boone</a>	10300102		M	2026 - 2030
254	2006	<a href="#">1863.00</a>	L. Dry Fk.	P	N (1)	5.20	Miles	AOL	Oxygen, Dissolved (W)	Rolla SE WWTP	<a href="#">Phebus</a>	07140102		M	2026 - 2030
255	2006	<a href="#">1864.00</a>	L. Dry Fk.	C	N (0.6)	4.70	Miles	AOL	Oxygen, Dissolved (W)	Rolla SE WWTP	<a href="#">Phebus</a>	07140102		M	2026 - 2030
256	2008	<a href="#">1864.00</a>	L. Dry Fk.	C	Y	4.70	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	<a href="#">Phebus</a>	07140102		M	2026 - 2030
257	2006	<a href="#">1325.00</a>	L. Dry Wood Cr.	P	Y	20.50	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	<a href="#">Vernon</a>	10290104		M	2026 - 2030
258	2010	<a href="#">1326.00</a>	L. Dry Wood Cr.	C	Y	15.60	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	<a href="#">Baron/Vernon</a>	10290104		M	2026 - 2030
259	2012	<a href="#">3137.00</a>	Lee Rowe Ditch	C	Y	6.00	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	<a href="#">Mississippi</a>	08020201		M	2026 - 2030
260	2018	<a href="#">7346.00</a>	Lewis Lake	L3	Y	6.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	<a href="#">Stoddard</a>	08020204		L	> 10 years
261	2002	<a href="#">2020.00</a>	Lewisston Lake	L1	Y	35.00	Acres	DWS	Atrazine (W)	Rural NPS	<a href="#">Lewis</a>	07110002	2	M	2026 - 2030
262	2012	<a href="#">3575.00</a>	Line Cr.	C	Y	7.00	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	<a href="#">Platte</a>	10240011		H	2023
263	2018	<a href="#">4107.00</a>	Little Blue River tributary	C	Y	5.50	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	<a href="#">Jackson</a>	10300101		L	> 10 years
264	2020	<a href="#">2180.00</a>	Little Dixie Lake	L3	Y	176.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	<a href="#">Callaway</a>	10300102	1	L	> 10 years
265	2010	<a href="#">3279.00</a>	L. Lost Cr.	P	Y	5.80	Miles	WBC B	Escherichia coli (W)	Rural NPS	<a href="#">Newton</a>	11070206		H	2023
266	2006	<a href="#">0606.00</a>	Locust Cr.	P	N (37.7)	91.70	Miles	WBC B	Escherichia coli (W)	Rural NPS	<a href="#">Punnam/Sullivan</a>	10280103	2	H	2025
267	2012	<a href="#">2763.00</a>	Logan Cr.	P	N (6.1)	36.00	Miles	AOL	Lead (S)	Sweetwater Lead Mine/Mill	<a href="#">Reynolds</a>	11010007		M	2026 - 2030
268	2006	<a href="#">0696.00</a>	Long Branch Cr.	C	N (1.8)	14.80	Miles	AOL	Oxygen, Dissolved (W)	Atlanta WWTP	<a href="#">Macon</a>	10280203		M	2026 - 2030
269	2002	<a href="#">2097.00</a>	Longview Lake	L2	Y	955.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	<a href="#">Jackson</a>	10300101		L	> 10 years
270	2008	<a href="#">3652.00</a>	L. Osage R.	C	Y	23.60	Miles	WBC B	Escherichia coli (W)	Rural NPS	<a href="#">Vernon</a>	10290103		M	2026 - 2030
271	2006	<a href="#">3278.00</a>	Lost Cr.	P	Y	8.50	Miles	WBC A	Escherichia coli (W)	Rural NPS	<a href="#">Newton</a>	11070206		H	2021
272	2014	<a href="#">2854.00</a>	L. St. Francis R.	P	N (24.2)	32.40	Miles	AOL	Lead (S)	Catherine Lead Mine, pos. Mine La Motte	<a href="#">Madison</a>	08020202	2	H	2024
273	2006	<a href="#">2814.00</a>	Main Ditch	C	Y	13.00	Miles	AOL	pH (W)	Poplar Bluff WWTP	<a href="#">Butler</a>	11010007		M	2026 - 2030
274	2006	<a href="#">2814.00</a>	Main Ditch	C	Y	13.00	Miles	AOL	Temperature, water (W)	Channalization	<a href="#">Butler</a>	11010007		L	> 10 years
275	2012	<a href="#">3839.00</a>	Maline Cr.	C	Y	0.50	Miles	AOL	Chloride (W)	Urban Runoff/Storm Sewers	<a href="#">St. Louis City</a>	07140101		M	2026 - 2030
276	2016	<a href="#">3839.00</a>	Maline Cr.	C	Y	0.50	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	<a href="#">St. Louis City</a>	07140101		M	2026 - 2030
277	2016	<a href="#">7398.00</a>	Maple Leaf Lake	L3	Y	127.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	<a href="#">Lafayette</a>	10300104		L	> 10 years
278	2002	<a href="#">2033.00</a>	Mark Twain Lake	L2	Y	18132.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	<a href="#">Rolls</a>	07110005	2	L	> 10 years
279	2018	<a href="#">4109.00</a>	Martigney Creek	C	Y	1.60	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	<a href="#">St. Louis</a>	07140101		M	2026 - 2030
280	2018	<a href="#">4109.00</a>	Martigney Creek	C	Y	1.60	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	<a href="#">St. Louis</a>	07140101		M	2026 - 2030
281	2014	<a href="#">3596.00</a>	Mattsee Cr.	P	Y	1.10	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	<a href="#">St. Louis</a>	07140102		M	2026 - 2030
282	2016	<a href="#">1786.00</a>	McClanahan Cr.	C	Y	2.50	Miles	SCR	Escherichia coli (W)	Source Unknown	<a href="#">Perry</a>	07140105		M	2026 - 2030
283	2016	<a href="#">1786.00</a>	McClanahan Cr.	C	Y	2.50	Miles	WBC B	Escherichia coli (W)	Source Unknown	<a href="#">Perry</a>	07140105		M	2026 - 2030
284	2008	<a href="#">2183.00</a>	Meramee R.	P	Y	22.80	Miles	AOL	Lead (S)	Old Lead belt tailings	<a href="#">St. Louis</a>	07140102	2	M	2026 - 2030
285	2010	<a href="#">0123.00</a>	M. Fk. Salt R.	C	N (11.4)	25.40	Miles	AOL	Oxygen, Dissolved (W)	Macon WWTP	<a href="#">Macon</a>	07110006		M	2026 - 2030
286	2008	<a href="#">1299.00</a>	Miami Cr.	P	Y	19.60	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	<a href="#">Bates</a>	10290102		M	2026 - 2030
287	2006	<a href="#">0468.00</a>	Middle Fk. Grand R.	P	Y	27.50	Miles	WBC A	Escherichia coli (W)	Rural NPS	<a href="#">Worth/Gearty</a>	10280101		H	2023
288	2010	<a href="#">3262.00</a>	Middle Indian Cr.	C	Y	3.50	Miles	AOL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Source Unknown	<a href="#">Newton</a>	11070208	5	M	2026 - 2030
289	2010	<a href="#">3263.00</a>	Middle Indian Cr.	P	Y	2.20	Miles	AOL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Source Unknown	<a href="#">Newton</a>	11070208	5	M	2026 - 2030

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290	2008	<u>3263.00</u>	Middle Indian Cr.	P	Y	2.20	Miles	WBC B	Escherichia coli (W)	Rural NPS	Newton	11070208		H	2021
291	2016	<u>4066.00</u>	Mill Creek	C	Y	3.40	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jackson	10300101		H	2024
292	2016	<u>4066.00</u>	Mill Creek	C	Y	3.40	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jackson	10300101		H	2024
293	2016	<u>4066.00</u>	Mill Creek	C	Y	3.40	Miles	AOL	Oxygen, Dissolved (W)	Urban Runoff/Storm Sewers	Jackson	10300101		M	2026 - 2030
294	2008	<u>1604.00</u>	Missouri R.	P	N (33.9)	104.50	Miles	WBC B	Escherichia coli (W)	Municipal Point Source Discharges, Nonpoint Source	St. Charles/St. Louis	10300200	2	L	> 10 years
295	2010	<u>0226.00</u>	Missouri R.	P	Y	184.50	Miles	WBC B	Escherichia coli (W)	Municipal Point Source Discharges, Nonpoint Source	Alchison/Jackson	10240011	2	L	> 10 years
296	2012	<u>0356.00</u>	Missouri R.	P	Y	129.00	Miles	WBC B	Escherichia coli (W)	Municipal Point Source Discharges, Nonpoint Source	Jackson/Chariton	10300101	2	L	> 10 years
297	2020	<u>7031.00</u>	Monroe City Lake	L1	Y	94.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Rails	07110007	1.2	L	> 10 years
298	2014	<u>7031.00</u>	Monroe City Lake	L1	Y	94.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Rails	07110007	2	L	> 10 years
299	2020	<u>7034.00</u>	Monroe City Lake B	L1	Y	55.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Monroe	07110007	1.2	L	> 10 years
300	2018	<u>7301.00</u>	Monsanto Lake	L3	Y	18.00	Acres	AOL	Chlorophyll-a (W)	Source Unknown	St. Francois	07140104	1.3.7	L	> 10 years
301	2016	<u>7301.00</u>	Monsanto Lake	L3	Y	18.00	Acres	AOL	Nitrogen, Total (W)	Source Unknown	St. Francois	07140104	1.3.7	L	> 10 years
302	2018	<u>7301.00</u>	Monsanto Lake	L3	Y	18.00	Acres	AOL	Phosphorus, Total (W)	Source Unknown	St. Francois	07140104	1.3.7	L	> 10 years
303	2020	<u>7402.00</u>	Mozingo Lake	L1	Y	998.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Nodaway	10240013	1.2	L	> 10 years
304	2010	<u>7402.00</u>	Mozingo Lake	L1	Y	998.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Nodaway	10240013	2	L	> 10 years
305	2018	<u>0853.00</u>	Muddy Cr.	P	Y	62.20	Miles	WBC B	Escherichia coli (W)	Rural NPS	Peutic	10300103		M	2026 - 2030
306	2020	<u>7136.00</u>	New Marcelline City Lake	L1	Y	160.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Chariton	10280103	1.2	L	> 10 years
307	2018	<u>0158.00</u>	N. Fk. Cuivre R.	P	Y	25.10	Miles	WBC A	Escherichia coli (W)	Rural NPS	Pike/Lincoln	07110008		H	2020
308	2016	<u>0110.00</u>	N. Fk. Salt R.	P	Y	84.90	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Shelby/Monroe	07110005	2	L	> 10 years
309	2008	<u>3186.00</u>	N. Fk. Spring R.	P	Y	17.40	Miles	WBC B	Escherichia coli (W)	Rural NPS	Jasper	11070207	9	L	> 10 years
310	2008	<u>3188.00</u>	N. Fk. Spring R.	C	Y	55.90	Miles	WBC B	Escherichia coli (W)	Rural NPS	Dade/Jasper	11070207	9	L	> 10 years
311	2006	<u>3188.00</u>	N. Fk. Spring R.	C	Y	55.90	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Dade/Jasper	11070207		M	2020 - 2030
312	2012	<u>3260.00</u>	N. Indian Cr.	P	Y	5.20	Miles	AOL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Source Unknown	Newton	11070208	5	M	2026 - 2030
313	2008	<u>3260.00</u>	N. Indian Cr.	P	Y	5.20	Miles	WBC B	Escherichia coli (W)	Rural NPS	Newton	11070208		H	2021
314	2014	<u>0227.00</u>	Nishabonna R.	P	Y	10.20	Miles	WBC B	Escherichia coli (W)	Rural NPS	Alchison	10240004	2	M	2026 - 2030
315	2018	<u>0227.00</u>	Nishabonna R.	P	Y	10.20	Miles	SCR	Escherichia coli (W)	Rural NPS	Alchison	10240004	2	M	2026 - 2030
316	2014	<u>7316.00</u>	Noblett Lake	L3	Y	26.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Douglas	11010006	1.7	L	> 10 years
317	2002	<u>7316.00</u>	Noblett Lake	L3	Y	26.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Douglas	11010006	7	L	> 10 years
318	2014	<u>7316.00</u>	Noblett Lake	L3	Y	26.00	Acres	AOL	Phosphorus, Total (W)	Nonpoint Source	Douglas	11010006	1.7	L	> 10 years
319	2006	<u>0550.00</u>	No Cr.	P	Y	28.70	Miles	WBC B	Escherichia coli (W)	Rural NPS	Grandby/Livinston	10280102		M	2026 - 2030
320	2010	<u>0550.00</u>	No Cr.	P	Y	28.70	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Grandby/Livinston	10280102		M	2026 - 2030
321	2020	<u>7076.00</u>	Nodaway Lake	L3	Y	73.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Nodaway	10240013	1	L	> 10 years
322	2010	<u>0279.00</u>	Nodaway R.	P	Y	59.30	Miles	WBC B	Escherichia coli (W)	Rural NPS	Nodaway/Andrew	10240010		H	2020
323	2016	<u>7317.00</u>	Norfolk Lake	L2	Y	1000.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Drake	11010006		L	> 10 years
324	2010	<u>7109.00</u>	North Bethany City Reservoir	L3	Y	78.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Harrison	10280101		L	> 10 years
325	2014	<u>3811.00</u>	North Branch Wilsons Cr.	P	Y	3.80	Miles	AOL	Zinc (S)	Urban NPS	Greene	11010002		M	2026 - 2030
326	2020	<u>7218.00</u>	North Lake	L3	Y	19.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Cass	10290108	1	L	> 10 years
327	2016	<u>1794.00</u>	Onette Cr.	C	Y	1.20	Miles	SCR	Escherichia coli (W)	Source Unknown	Perry	07140105		M	2026 - 2030
328	2016	<u>1794.00</u>	Onette Cr.	C	Y	1.20	Miles	WBC B	Escherichia coli (W)	Source Unknown	Perry	07140105		M	2026 - 2030
329	2018	<u>3190.00</u>	Opossum Cr.	C	Y	6.40	Miles	WBC B	Escherichia coli (W)	Rural NPS	Jasper	11070207	9	L	> 10 years
330	2016	<u>1293.00</u>	Osage R.	P	Y	80.70	Miles	WBC A	Escherichia coli (W)	Source Unknown	Vernon/St. Clair	10290105		H	2020
331	2006	<u>1373.00</u>	Panther Cr.	C	Y	9.70	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Polk/St. Clair	10290106		M	2026 - 2030

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332	2008	<a href="#">2373.00</a>	Pearson Cr.	P	Y	8.00	Miles	AOL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Source Unknown	Greene	11010002	5	L	2031
333	2006	<a href="#">2373.00</a>	Pearson Cr.	P	Y	8.00	Miles	WBC A	Escherichia coli (W)	Rural NPS	Greene	11010002		L	2031
334	2016	<a href="#">0999.00</a>	Peno Cr.	C	Y	14.40	Miles	AOL	Oxygen, Dissolved (W)	Northeast Correctional Center WWTP	Pike	07110007		M	2026 - 2030
335	2020	<a href="#">2273.00</a>	Perry County Community Lake	L3	Y	89.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Perry	07140105	1	L	> 10 years
336	2008	<a href="#">7628.00</a>	Perry Phillips Lake	UL	Y	32.00	Acres	GEN	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Boone	10300102	4	L	> 10 years
337	2002	<a href="#">0218.00</a>	Perique Cr.	C	Y	10.90	Miles	AOL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Nonpoint Source	Warren/St. Charles	07110009	5	M	2026 - 2030
338	2012	<a href="#">0215.00</a>	Perique Cr.	P1	Y	9.60	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	St. Charles	07110009		M	2026 - 2030
339	2016	<a href="#">0218.00</a>	Perique Cr.	C	Y	10.90	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Warren/St. Charles	07110009		M	2026 - 2030
340	2018	<a href="#">0785.00</a>	Petite Saline Cr.	P	Y	21.00	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Cooper/Montauque	10300102		L	> 10 years
341	2010	<a href="#">2815.00</a>	Pike Cr.	C	Y	6.00	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Builer	11010007		M	2026 - 2030
342	2010	<a href="#">0312.00</a>	Platte R.	P	Y	142.40	Miles	WBC B	Escherichia coli (W)	Rural NPS	Worth/Platte	10240012	2	H	2020
343	2012	<a href="#">1327.00</a>	Pleasant Run Cr.	C	Y	7.60	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Vernon	10290104		M	2026 - 2030
344	2006	<a href="#">3120.00</a>	Pole Cat Slough	P	Y	12.60	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Dunklin	08020204		M	2026 - 2030
345	2014	<a href="#">3120.00</a>	Pole Cat Slough	P	Y	12.60	Miles	AOL	Temperature, water (W)	Source Unknown	Dunklin	08020204		M	2026 - 2030
346	2020	<a href="#">2338.00</a>	Pomme de Terre Lake	L2	Y	7820.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Hickory/Polk	10290107	1	L	> 10 years
347	2020	<a href="#">2213.00</a>	Rainette Lake	L3	Y	248.10	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Cass	10290108	1	L	> 10 years
348	2020	<a href="#">2083.00</a>	Ray County Community Lake	L3	Y	23.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Ray	10300101	1	L	> 10 years
349	2018	<a href="#">0743.00</a>	Renfro Cr.	C	Y	1.50	Miles	AOL	Oxygen, Dissolved (W)	Abandoned Mine Lands and Rural NPS	Callaway/Boone	10300102		L	> 10 years
350	2016	<a href="#">2204.00</a>	Rioquelin Trail Community Lake	L3	Y	27.00	Acres	IHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Marion	10290111		L	> 10 years
351	2006	<a href="#">1710.00</a>	River des Peres	P	Y	2.60	Miles	AOL	Chloride (W)	Urban Runoff/Storm Sewers	St. Louis City	07140101		H	2025
352	2006	<a href="#">3972.00</a>	River des Peres	C	Y	13.60	Miles	AOL	Chloride (W)	Urban Runoff/Storm Sewers	St. Louis	07140101		II	2025
353	2012	<a href="#">1710.00</a>	River des Peres	P	Y	2.60	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis City	07140101		M	2026 - 2030
354	2016	<a href="#">3972.00</a>	River des Peres	C	Y	13.60	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140101		M	2026 - 2030
355	2016	<a href="#">3972.00</a>	River des Peres	C	Y	13.60	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140101		M	2026 - 2030
356	2018	<a href="#">4111.00</a>	River des Peres tributary	C	Y	1.80	Miles	AOL	Chloride (W)	Urban Runoff/Storm Sewers	St. Louis	07140101		L	> 10 years
357	2018	<a href="#">4111.00</a>	River des Peres tributary	C	Y	1.80	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140101		L	> 10 years
358	2018	<a href="#">4111.00</a>	River des Peres tributary	C	Y	1.80	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140101		M	2026 - 2030
359	2018	<a href="#">4106.00</a>	Rock Creek	C	Y	6.20	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jackson/Clay	10300101		H	2023
360	2018	<a href="#">4106.00</a>	Rock Creek	C	Y	6.20	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jackson/Clay	10300101		H	2023
361	2020	<a href="#">2086.00</a>	Rocky Hollow Lake	L3	Y	20.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Clay	10300101	1	L	> 10 years
362	2020	<a href="#">2164.00</a>	Rothwell Lake	L3	Y	27.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Randolph	10280203	1	L	> 10 years
363	2018	<a href="#">3577.00</a>	Salt Br.	C	Y	0.80	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Polk	10290106		L	> 10 years
364	2010	<a href="#">0994.00</a>	Salt Cr.	C	Y	14.90	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Chariton	10280103		M	2026 - 2030
365	2014	<a href="#">0893.00</a>	Salt Fk.	P	Y	26.70	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Saline	10300104		M	2026 - 2030
366	2012	<a href="#">2113.00</a>	Salt Pine Cr.	C	Y	1.20	Miles	AOL	Lead (S)	Barite tailings pond	Washington	07140104		M	2026 - 2030
367	2012	<a href="#">2113.00</a>	Salt Pine Cr.	C	Y	1.20	Miles	AOL	Zinc (S)	Barite tailings pond	Washington	07140104		M	2026 - 2030
368	2012	<a href="#">0103.00</a>	Salt R.	P1	Y	9.30	Miles	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Rolls	07110007	2	L	> 10 years
369	2008	<a href="#">0091.00</a>	Salt R.	P	Y	29.00	Miles	AOL	Oxygen, Dissolved (W)	Mark Twain Lake re-regulation dam	Rolls/Pike	07110007	2	L	> 10 years
370	2014	<a href="#">0103.00</a>	Salt R.	P1	Y	9.30	Miles	AOL	Oxygen, Dissolved (W)	Cannon Dam	Rolls	07110007	2	L	> 10 years
371	2006	<a href="#">0655.00</a>	S. Blackbird Cr.	C	Y	13.00	Miles	AOL	Ammonia, Total (W)	Source Unknown	Putnam	10280201		M	2026 - 2030
372	2006	<a href="#">0142.00</a>	S. Fk. Salt R.	C	N (20.1)	40.10	Miles	AOL	Oxygen, Dissolved (W)	Mexico WWTP, Rural Nonpoint Source	Callaway/Audrain	07110006		M	2026 - 2030

Row #	Year	WRID	Waterbody	Class	Entire WB Impd	WB Size	Units	IU	Pollutant	Source	County Up/Down	HUC 8	Comment	TMDL Priority	TMDL Schedule Year
373	2020	<a href="#">0141.00</a>	S. Fk. Salt R.	P	Y	9.30	Miles	AQL	pH (W)	Nonpoint Source	<a href="#">Monroe</a>	07110006		L	> 10 years
374	2006	<a href="#">1249.00</a>	S. Grand R.	P	Y	66.80	Miles	WBC B	Escherichia coli (W)	Rural NPS	<a href="#">Cass/Henry</a>	10290108		H	2020
375	2020	<a href="#">2865.00</a>	Shays Cr.	C	Y	1.70	Miles	AQL	Lead (S)	Mine La Motte	<a href="#">Madison</a>	08020202		L	> 10 years
376	2020	<a href="#">7042.00</a>	Shelbina Lake	L1	Y	45.00	Acres	AQL	Chlorophyll-a (W)	Nonpoint Source	<a href="#">Shelby</a>	07110005	1.2	L	> 10 years
377	2014	<a href="#">3222.00</a>	Shoal Cr.	P	N (3.8)	50.50	Miles	AQL	Zinc (S)	Mill Tailings	<a href="#">Newton</a>	11070207	2	M	2026 - 2030
378	2014	<a href="#">3981.00</a>	Shoal Creek tributary	C	Y	1.90	Miles	GEN	Cadmium (W)	Tanyard Hollow Pits	<a href="#">Jasper/Newton</a>	11070207	4	M	2026 - 2030
379	2020	<a href="#">3982.00</a>	Shoal Creek tributary	C	Y	2.20	Miles	AQL	Cadmium (W)	MHI Tailings	<a href="#">Jasper</a>	11070207	4	M	2026 - 2030
380	2014	<a href="#">3981.00</a>	Shoal Creek tributary	C	Y	1.90	Miles	GEN	Zinc (W)	Tanyard Hollow Pits	<a href="#">Jasper/Newton</a>	11070207	4	M	2026 - 2030
381	2014	<a href="#">3982.00</a>	Shoal Creek tributary	C	Y	2.20	Miles	AQL	Zinc (W)	Mill Tailings	<a href="#">Jasper</a>	11070207		M	2026 - 2030
382	2018	<a href="#">3244.00</a>	Silver Cr.	P	Y	1.90	Miles	AQL	Zinc (S)	Mill Tailings	<a href="#">Newton</a>	11070207		M	2026 - 2030
383	2012	<a href="#">3259.00</a>	S. Indian Cr.	P	Y	8.70	Miles	AQL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Source Unknown	<a href="#">McDonald/Newton</a>	11070208	5	M	2026 - 2030
384	2008	<a href="#">3259.00</a>	S. Indian Cr.	P	Y	8.70	Miles	WBC B	Escherichia coli (W)	Rural NPS	<a href="#">McDonald/Newton</a>	11070208		H	2021
385	2014	<a href="#">3754.00</a>	Slater Br.	C	Y	3.70	Miles	WBC B	Escherichia coli (W)	Nonpoint Source	<a href="#">Jasper</a>	11070207	9	L	> 10 years
386	2006	<a href="#">0399.00</a>	Snake-bar Cr.	P	Y	36.60	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	<a href="#">Jackson/Lafayette</a>	10300101		M	2026 - 2030
387	2012	<a href="#">0224.00</a>	Spencer Cr.	C	Y	1.50	Miles	AQL	Chloride (W)	Road/Bridge Runoff, Non-construction	<a href="#">St. Charles</a>	07110009		M	2026 - 2030
388	2016	<a href="#">5007.00</a>	Spring Branch	C	N (1.4)	3.10	Miles	WBC B	Escherichia coli (W)	Source Unknown	<a href="#">St. Louis</a>	07140102		H	2024
389	2018	<a href="#">5004.00</a>	Spring Branch	C	Y	6.70	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	<a href="#">Jackson</a>	10300101		H	2024
390	2018	<a href="#">5004.00</a>	Spring Branch	C	Y	6.70	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	<a href="#">Jackson</a>	10300101		H	2024
391	2006	<a href="#">3160.00</a>	Spring R.	P	Y	61.70	Miles	WBC A	Escherichia coli (W)	Rural NPS	<a href="#">Lawrence/Jasper</a>	11070207	9	L	> 10 years
392	2010	<a href="#">3164.00</a>	Spring R.	P	Y	8.80	Miles	WBC A	Escherichia coli (W)	Rural NPS	<a href="#">Lawrence</a>	11070207	9	L	> 10 years
393	2010	<a href="#">3165.00</a>	Spring R.	P	Y	11.90	Miles	WBC A	Escherichia coli (W)	Rural NPS	<a href="#">Lawrence</a>	11070207	9	L	> 10 years
394	2018	<a href="#">4112.00</a>	Spring River tributary	C	Y	4.00	Miles	WBC B	Escherichia coli (W)	Nonpoint Source	<a href="#">Jasper</a>	11070207	9	L	> 10 years
395	2018	<a href="#">2677.00</a>	Spring Valley Cr.	P	Y	10.80	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	<a href="#">Shannon</a>	11010008		L	> 10 years
396	2006	<a href="#">3135.00</a>	Stevenson Bayou	C	Y	6.40	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	<a href="#">Mississippi</a>	08020201		M	2026 - 2030
397	2012	<a href="#">2835.00</a>	St. Francis R.	P	N (8.4)	93.10	Miles	CLF	Temperature, water (W)	Source Unknown	<a href="#">St. Francis</a>	08020202		M	2026 - 2030
398	2006	<a href="#">3138.00</a>	St. Johns Ditch	P	Y	15.30	Miles	IHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	<a href="#">New Madrid</a>	08020201		L	> 10 years
399	2006	<a href="#">0959.00</a>	Straight Fk.	C	Y	6.00	Miles	AQL	Oxygen, Dissolved (W)	Versailles WWTP	<a href="#">Merger</a>	10300102		H	2025
400	2006	<a href="#">0686.00</a>	Sugar Cr.	P	Y	6.80	Miles	AQL	Oxygen, Dissolved (W)	Source Unknown	<a href="#">Randolph</a>	10280203		M	2026 - 2030
401	2018	<a href="#">0686.00</a>	Sugar Cr.	P	Y	6.80	Miles	AQL	Sulfate + Chloride (W)	Source Unknown	<a href="#">Randolph</a>	10280203		L	> 10 years
402	2018	<a href="#">4108.00</a>	Sugar Creek	C	Y	1.80	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	<a href="#">St. Louis</a>	07140101		M	2026 - 2030
403	2018	<a href="#">4108.00</a>	Sugar Creek	C	Y	1.80	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	<a href="#">St. Louis</a>	07140101		M	2026 - 2030
404	2014	<a href="#">2166.00</a>	Sugar Creek Lake	L1	Y	308.00	Acres	IHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	<a href="#">Randolph</a>	10280203	2	L	> 10 years
405	2006	<a href="#">7399.00</a>	Sunset Lake	L3	Y	6.00	Acres	FHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	<a href="#">Cole</a>	10300102		L	> 10 years
406	2002	<a href="#">7313.00</a>	Table Rock Lake	L2	Y	41747.00	Acres	AQL	Chlorophyll-a (W)	Municipal Point Source Discharges, Nonpoint Source	<a href="#">Stone</a>	11010001	1.7	H	2025
407	2002	<a href="#">7313.00</a>	Table Rock Lake	L2	Y	41747.00	Acres	AQL	Nitrogen, Total (W)	Municipal Point Source Discharges, Nonpoint Source	<a href="#">Stone</a>	11010001	1.7	H	2025
408	2002	<a href="#">7313.00</a>	Table Rock Lake	L2	Y	41747.00	Acres	AQL	Nutrient/Eutrophication Biol. Indicators (W)	Municipal Point Source Discharges, Nonpoint Source	<a href="#">Stone</a>	11010001	1.7	H	2025
409	2016	<a href="#">7352.00</a>	Thirtyfour Corner Blue Hole	L3	Y	9.00	Acres	FHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	<a href="#">Mississippi</a>	08010100		L	> 10 years
410	2008	<a href="#">0549.00</a>	Thompson R.	P	N (5.2)	70.60	Miles	WBC B	Escherichia coli (W)	Rural NPS	<a href="#">Harrison</a>	10280102	2	H	2021
411	2012	<a href="#">3243.00</a>	Thurman Cr.	P	Y	3.00	Miles	WBC B	Escherichia coli (W)	Rural NPS	<a href="#">Newton</a>	11070207	9	L	> 10 years
412	2018	<a href="#">2114.00</a>	Trib. Old Mines Cr.	C	Y	1.50	Miles	AQL	Lead (S)	Barite tailings pond	<a href="#">Washington</a>	07140104		M	2026 - 2030
413	2010	<a href="#">2114.00</a>	Trib. Old Mines Cr.	C	Y	1.50	Miles	AQL	Sedimentation/Siltation (S)	Barite tailings pond	<a href="#">Washington</a>	07140104		M	2026 - 2030
414	2018	<a href="#">2114.00</a>	Trib. Old Mines Cr.	C	Y	1.50	Miles	AQL	Zinc (S)	Barite tailings pond	<a href="#">Washington</a>	07140104		M	2026 - 2030



Row #	Year	WBID	Waterbody	Class	Entire WB Imprd	WB Size	Units	IU	Pollutant	Source	County Up/Down	HUC 8	Comment	TMDL Priority	TMDL Schedule Year
415	2010	<a href="#">1420.00</a>	Trib. to Goose Cr.	C	Y	3.00	Miles	WBC B	Escherichia coli (W)	Rural NPS	Lawrence	10290106		H	2021
416	2006	<a href="#">3490.00</a>	Trib. to L. Mundy Cr.	C	Y	1.00	Miles	AOL	Chloride (W)	Tyson Foods	Perlis	10300103		L	> 10 years
417	2006	<a href="#">3589.00</a>	Trib. to Wolf Cr.	C	Y	1.50	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	St. Francois	08020202		M	2026 - 2030
418	2006	<a href="#">0074.00</a>	Troublesome Cr.	C	N (6.1)	41.30	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Knox	07110003		M	2026 - 2030
419	2012	<a href="#">0074.00</a>	Troublesome Cr.	C	Y	41.30	Miles	AOL	Sedimentation/Siltation (S)	Habitat Mod. - other than Hydromod.	Knox/Marion	07110003		L	> 10 years
420	2012	<a href="#">3175.00</a>	Truit Cr.	C	Y	6.40	Miles	SCR	Escherichia coli (W)	Rural NPS	Lawrence	11070207	9	L	> 10 years
421	2016	<a href="#">3174.00</a>	Truit Cr.	P	Y	1.50	Miles	WBC B	Escherichia coli (W)	Rural NPS	Lawrence	11070207	9	L	> 10 years
422	2018	<a href="#">2985.00</a>	Turkey Cr.	C	N (2.3)	3.10	Miles	AOL	Ammonia, Total (W)	Puxico WWTF	Stoddard	08020203		L	> 10 years
423	2006	<a href="#">3216.00</a>	Turkey Cr.	P	Y	7.70	Miles	AOL	Cadmium (S)	Tri-State Mining District	Jasper	11070207		H	2021
424	2006	<a href="#">3217.00</a>	Turkey Cr.	P	Y	6.10	Miles	AOL	Cadmium (S)	Tri-State Mining District	Jasper	11070207		H	2021
425	2016	<a href="#">3282.00</a>	Turkey Cr.	P	Y	2.40	Miles	AOL	Cadmium (S)	Bonne Terre chat pile	St. Francois	07140104		M	2026 - 2030
426	2006	<a href="#">3216.00</a>	Turkey Cr.	P	Y	7.70	Miles	AOL	Cadmium (W)	Tri-State Mining District	Jasper	11070207		H	2021
427	2006	<a href="#">3282.00</a>	Turkey Cr.	P	Y	2.40	Miles	AOL	Cadmium (W)	Bonne Terre chat pile	St. Francois	07140104		M	2026 - 2030
428	2016	<a href="#">3282.00</a>	Turkey Cr.	P	Y	2.40	Miles	AOL	Copper (S)	Bonne Terre chat pile	St. Francois	07140104		M	2026 - 2030
429	2006	<a href="#">3216.00</a>	Turkey Cr.	P	N (4.5)	7.70	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jasper	11070207	9	L	> 10 years
430	2006	<a href="#">3217.00</a>	Turkey Cr.	P	Y	6.10	Miles	WBC A	Escherichia coli (W)	Urban Runoff/Storm Sewers	Jasper	11070207	9	L	> 10 years
431	2012	<a href="#">0751.00</a>	Turkey Cr.	C	Y	6.30	Miles	WBC A	Escherichia coli (W)	Source Unknown	Boone	10300102		H	2023
432	2006	<a href="#">3217.00</a>	Turkey Cr.	P	Y	6.10	Miles	AOL	Lead (S)	Tri-State Mining District	Jasper	11070207		H	2021
433	2008	<a href="#">3216.00</a>	Turkey Cr.	P	Y	7.70	Miles	AOL	Lead (S)	Tri-State Mining District	Jasper	11070207		H	2021
434	2016	<a href="#">3282.00</a>	Turkey Cr.	P	Y	2.40	Miles	AOL	Lead (S)	Bonne Terre chat pile	St. Francois	07140104		M	2026 - 2030
435	2006	<a href="#">3282.00</a>	Turkey Cr.	P	Y	2.40	Miles	AOL	Lead (W)	Bonne Terre chat pile	St. Francois	07140104		M	2026 - 2030
436	2016	<a href="#">3282.00</a>	Turkey Cr.	P	Y	2.40	Miles	AOL	Nickel (S)	Bonne Terre chat pile	St. Francois	07140104		M	2026 - 2030
437	2018	<a href="#">2985.00</a>	Turkey Cr.	C	N (2.3)	3.10	Miles	AOL	Oxygen, Dissolved (W)	Puxico WWTF	Stoddard	08020203		L	> 10 years
438	2006	<a href="#">3216.00</a>	Turkey Cr.	P	Y	7.70	Miles	AOL	Zinc (S)	Tri-State Mining District	Jasper	11070207		H	2021
439	2006	<a href="#">3217.00</a>	Turkey Cr.	P	Y	6.10	Miles	AOL	Zinc (S)	Tri-State Mining District	Jasper	11070207		H	2021
440	2016	<a href="#">3282.00</a>	Turkey Cr.	P	Y	2.40	Miles	AOL	Zinc (S)	Bonne Terre chat pile	St. Francois	07140104		M	2026 - 2030
441	2006	<a href="#">3282.00</a>	Turkey Cr.	P	N (1.2)	2.40	Miles	AOL	Zinc (W)	Bonne Terre chat pile	St. Francois	07140104		M	2026 - 2030
442	2014	<a href="#">3983.00</a>	Turkey Creek tributary	C	Y	2.90	Miles	GEN	Cadmium (S)	Abandoned Smelter Site	Jasper	11070207	4	H	2021
443	2016	<a href="#">3983.00</a>	Turkey Creek tributary	C	Y	2.90	Miles	GEN	Cadmium (W)	Abandoned Smelter Site	Jasper	11070207	4	H	2021
444	2016	<a href="#">3984.00</a>	Turkey Creek tributary	C	Y	2.20	Miles	GEN	Cadmium (W)	Mill Tailings	Jasper	11070207	4	H	2021
445	2014	<a href="#">3983.00</a>	Turkey Creek tributary	C	Y	2.90	Miles	GEN	Lead (S)	Abandoned Smelter Site	Jasper	11070207	4	H	2021
446	2014	<a href="#">3983.00</a>	Turkey Creek tributary	C	Y	2.90	Miles	GEN	Zinc (S)	Abandoned Smelter Site	Jasper	11070207	4	H	2021
447	2014	<a href="#">3983.00</a>	Turkey Creek tributary	C	Y	2.90	Miles	GEN	Zinc (W)	Abandoned Smelter Site	Jasper	11070207	4	H	2021
448	2014	<a href="#">3984.00</a>	Turkey Creek tributary	C	Y	2.20	Miles	GEN	Zinc (W)	Leadwood Hollow pits	Jasper	11070207	4	H	2021
449	2014	<a href="#">3985.00</a>	Turkey Creek tributary	C	Y	1.60	Miles	GEN	Zinc (W)	Chitwood Hollow pits	Jasper	11070207	4	H	2021
450	2010	<a href="#">1414.00</a>	Turnback Cr.	P	Y	19.90	Miles	WBC A	Escherichia coli (W)	Rural NPS	Lawrence/Dade	10290106		H	2021
451	2016	<a href="#">4079.00</a>	Twomile Creek	C	Y	5.60	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140101		M	2026 - 2030
452	2016	<a href="#">7099.00</a>	Unity Village Lake #2	L1	Y	26.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Tonks	Jackson	10300101	2	L	> 10 years
453	2020	<a href="#">7051.00</a>	Vandalia Community Lake	L3	Y	35.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Audrain	07110008	1	L	> 10 years
454	2020	<a href="#">7032.00</a>	Vandalia Reservoir	L1	Y	28.00	Acres	AOL	Chlorophyll-a (W)	Nonpoint Source	Blaze	07110007	1 2	L	> 10 years
455	2006	<a href="#">1708.00</a>	Watkins Creek	C	Y	6.40	Miles	AOL	Chloride (W)	Urban Runoff/Storm Sewers	St. Louis/St. Louis City	07140101		H	2025
456	2016	<a href="#">4097.00</a>	Watkins Creek tributary	C	Y	1.20	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140101		L	> 10 years
457	2016	<a href="#">4097.00</a>	Watkins Creek tributary	C	Y	1.20	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140101		L	> 10 years

Row #	Year	WBID	Waterbody	Class	Entire WB Imprd	WB Size	Units	IU	Pollutant	Source	County Up/Down	HUC 8	Comment	TMDL Priority	TMDL Schedule Year
458	2016	<a href="#">4098.00</a>	Watkins Creek tributary	C	Y	1.20	Miles	SCR	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140101		L	> 10 years
459	2016	<a href="#">4098.00</a>	Watkins Creek tributary	C	Y	1.20	Miles	WBC B	Escherichia coli (W)	Urban Runoff/Storm Sewers	St. Louis	07140101		L	> 10 years
<b>460</b>	<b>2020</b>	<b><a href="#">2072.00</a></b>	<b>Waukomis Lake</b>	<b>L3</b>	<b>Y</b>	<b>76.00</b>	<b>Acres</b>	<b>AOL</b>	<b>Phosphorus, Total (W)</b>	<b>Nonpoint Source</b>	<b>Platte</b>	<b>10240011</b>	<b>1.7</b>	L	> 10 years
461	2012	<a href="#">2071.00</a>	Wetherby Lake	L3	Y	185.00	Acres	AOL	Chlorophyll-a (W)	Urban Runoff/Storm Sewers	Platte	10240011	1.7	L	> 10 years
462	2012	<a href="#">2071.00</a>	Wetherby Lake	L3	Y	185.00	Acres	HHP	Mercury in Fish Tissue (T)	Atmospheric Deposition - Toxics	Platte	10240011	7	L	> 10 years
463	2010	<a href="#">2071.00</a>	Wetherby Lake	L3	Y	185.00	Acres	AOL	Nitrogen, Total (W)	Urban Runoff/Storm Sewers	Platte	10240011	1.7	L	> 10 years
464	2014	<a href="#">2071.00</a>	Wetherby Lake	L3	Y	185.00	Acres	AOL	Phosphorus, Total (W)	Urban Runoff/Storm Sewers	Platte	10240011	1.7	L	> 10 years
465	2006	<a href="#">0560.00</a>	Weldon R.	P	Y	43.40	Miles	WBC B	Escherichia coli (W)	Rural NPS	Mercer/Grundy	10280102		H	2021
466	2006	<a href="#">1317.00</a>	W. Fk. Dry Wood Cr.	C	Y	8.10	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Verona	10290104		M	2026 - 2030
467	2008	<a href="#">1504.00</a>	Whetstone Cr.	P	Y	12.20	Miles	AOL	Oxygen, Dissolved (W)	Rural NPS	Wright	10290201		H	2024
468	2010	<a href="#">3182.00</a>	White Oak Cr.	C	Y	18.00	Miles	WBC A	Escherichia coli (W)	Rural NPS	Lawrence/Jasper	11070207	9	L	> 10 years
469	2012	<a href="#">1700.00</a>	Wildhorse Cr.	C	Y	3.90	Miles	WBC B	Escherichia coli (W)	Rural, Residential Areas	St. Louis	10300200		M	2026 - 2030
470	2010	<a href="#">3171.00</a>	Williams Cr.	P	Y	1.00	Miles	WBC A	Escherichia coli (W)	Rural NPS	Lawrence	11070207	9	L	> 10 years
471	2010	<a href="#">3172.00</a>	Williams Cr.	P	Y	8.50	Miles	WBC A	Escherichia coli (W)	Rural NPS	Lawrence	11070207	9	L	> 10 years
472	2012	<a href="#">3594.00</a>	Williams Cr.	P	Y	1.00	Miles	WBC B	Escherichia coli (W)	Rural NPS	St. Louis	07140102		M	2026 - 2030
473	2014	<a href="#">3280.00</a>	Willow Br.	P	Y	2.20	Miles	AOL	Cadmium (S)	Mill Tailings	Newton	11070206		M	2026 - 2030
474	2010	<a href="#">3280.00</a>	Willow Br.	P	Y	2.20	Miles	WBC B	Escherichia coli (W)	Rural NPS	Newton	11070206		H	2021
475	2014	<a href="#">3280.00</a>	Willow Br.	P	Y	2.20	Miles	AOL	Zinc (S)	Mill Tailings	Newton	11070206		M	2026 - 2030
<b>476</b>	<b>2020</b>	<b><a href="#">7438.00</a></b>	<b>Willow Brook Lake</b>	<b>L1</b>	<b>Y</b>	<b>53.00</b>	<b>Acres</b>	<b>AOL</b>	<b>Chlorophyll-a (W)</b>	<b>Nonpoint Source</b>	<b>DeKalb</b>	<b>10280101</b>	<b>1.2</b>	L	> 10 years
477	2006	<a href="#">0955.00</a>	Willow Fk.	C	Y	6.80	Miles	AOL	Oxygen, Dissolved (W)	Tipton WWTP and Unknown Sources	Moniteau	10300102		H	2025
478	2006	<a href="#">0956.00</a>	Willow Fork tributary	C	Y	0.50	Miles	AOL	Oxygen, Dissolved (W)	Source Unknown	Moniteau	10300102		M	2026 - 2030
479	1998	<a href="#">2375.00</a>	Wilson Cr.	P	Y	14.00	Miles	AOL	Aquatic Macroinvertebrate Bioassessments/ Unknown (W)	Nonpoint Source	Greene	11010002	5	L	2031
480	2006	<a href="#">2375.00</a>	Wilson Cr.	P	N (7.4)	14.00	Miles	WBC B	Escherichia coli (W)	Nonpoint Source	Greene	11010002		L	2031
481	2014	<a href="#">2429.00</a>	Woods Fk.	C	Y	5.50	Miles	AOL	Fishes Bioassessments/ Unknown (W)	Source Unknown	Christian	11010003	5	M	2026 - 2030

**Key To List:**

Bolded rows are new listings for the 2020 listing cycle  
Row #: Row number that is not unique to any water, but is simply a count of the rows (listings)  
Year: Year this waterbody/pollutant pair was added to the 303(d) List

WBID: Unique waterbody identification number. Clicking the link will bring up a WQA Public Search webpage with the available data for that WBID

Waterbody: Name of the waterbody.

Class: Waterbody Classification in Missouri State Water Quality Standards: P - Permanently Flowing Waters, C - Intermittently Flowing Waters, L1 - Drinking Water Reservoirs, L2 - Large Multi-purpose Lakes,

L3 - Other Recreational Lakes, US - Unclassified Stream, UL - Unclassified Lake

Entire WB Imprd: Y= Yes the entire waterbody is considered impaired; N= No the entire waterbody is not considered impaired.

WB Size: Size of entire waterbody segment

IU: Impaired Use

AOL - Protection of Warm Water Aquatic Life; CLF - Cool-Water Fishery; CLD - Cold-Water Fishery; DWS - Drinking Water Supply; GEN - General Criteria; HHP - Human-Health Protection (Fish Consumption) ;

SCR - Secondary Contact Recreation ; WBC A - Whole Body Contact Recreation A (Designated Public Swimming Areas) ; WBC B - Whole Body Contact Recreation B (Those areas not considered WBC A)

Pollutant: The reason the water is impaired

Media Indicators: (W) - The pollutant is in the water ; (S) - The pollutant is in the sediment ; (T) - The pollutant is in the tissue of an organism ; If no media indicator is shown the pollutant is in the water

Source: The source of the pollutant causing the impairment

County Up/Down: The county of the upstream end and downstream end of the segment that is impaired. Clicking the link will bring up a map viewer displaying the location of the impaired portion of the waterbody.

Comment:

1 - Nutrient related impairment

2 - Water is a Public Drinking Water Supply

3 - Monomino Lake is part of the group of lakes known as the St. Joe State Park Lakes

4 - General Use pertaining to Aquatic Life

5 - This water is listed for either "Aquatic Macroinvertebrate Bioassessment/Unknown (W)" or "Fishes Bioassessment/Unknown (W)". This water lacks the necessary information to point to a discrete pollutant and does not show signs of habitat impairment. Since the Department currently cannot point to a specific pollutant as the cause, the water is being listed for the observed effect as the reason the water is impaired.

6 - Only Lac Capri of the Terre Du Lac Lakes is impaired

7 - Lake is impaired for site specific criteria

- 8 - Trend analysis shows this water will exceed WQS within 5 years. See the 2020 Listing Methodology Document and Nutrient Implementation Plan for more information.
- 9 - This water is being prioritized as low for TMDL development due to 319 watershed management plans being implemented in the watershed.

Missouri Department of Natural Resources, Water Protection Program. (573)751-1300, [www.dnr.mo.gov](http://www.dnr.mo.gov)

[http://www.dnr.mo.gov/mnswis\\_public/wq/waterbodySearch.do](http://www.dnr.mo.gov/mnswis_public/wq/waterbodySearch.do)  
<http://dnr.mo.gov/env/esp/wqm/biologicalassessments.htm>

**SECTION 01 7419**  
**CONSTRUCTION WASTE MANAGEMENT**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. All of the Contract Documents, including General and Special Conditions and Division 01 General Requirements, apply to the work of this Section.

**1.02 SUMMARY**

- A. This Section specifies requirements for the Contractor's implementation of waste management controls and systems for the duration of the Work.

The intent of this Section is to develop and implement a Construction Waste Management Plan (CWMP) in order to quantify material diverted from Solid Waste Disposal Facility or incineration. Target goal is at least fifty (50) percent of non-hazardous Demolition and Construction Debris generated by the construction project is diverted through recycling or salvage. Quantities must be reported by weight and consistent in units reported and calculation method throughout.

Diversion Methods and Materials Eligible for Reporting:

1. Appropriate materials suitably placed in a Clean Fill Site may be reported.
2. Appropriate materials diverted for use as Wood Derived Fuel (WDF) may be reported.

Diversion Methods and Materials Ineligible for Reporting:

3. Material disposal by incineration.
4. Excavated soil and land-clearing debris.
5. Material for use as Alternative Daily Cover (ADC).
6. Hazardous waste; should be disposed of according to relevant regulations.

- B. Contractor may subcontract work of this Section to a sub-contractor specializing in recycling and salvaging of construction waste.

**1.03 DEFINITIONS**

- A. **ALTERNATIVE DAILY COVER (ADC):** Material (other than earthen material) that is placed on the surface of the active face of a municipal solid waste landfill at the end of each operating day.
- B. **AVERAGE RECYCLING RATE:** The weighted average for the diversion of materials by the commingled (mixed-stream) recycling facility over time.
- C. **CLEAN FILL SITE:** Re-grading fill site for land reclamation or other beneficial use. Typically requiring permits, regular site maintenance and hours of operation. With material consisting of demolition debris and construction waste from buildings, roads and highway pavement, and other structures. Commonly comprised of brick, ceramics, concrete, and asphalt paving fragments that are virtually inert and pose neither a pollution threat to ground or surface waters nor a fire hazard. May contain minimal amounts of wood, metal, and inert solids.
- D. **COMMINGLED WASTE:** Waste streams that are combined on the project site and hauled away for sorting into recyclable streams. Also known as mixed or single-stream recycling.

- E. DEMOLITION AND CONSTRUCTION DEBRIS: Debris, waste and surplus materials, including recyclables, generated as a result of the Contractor's onsite activities while executing the requirements of the contract. Also, commonly includes materials from renovation, demolition, or deconstruction activities.
- F. RECYCLE: Recovery of materials, otherwise diverted from the solid waste stream for remanufacturing.
- G. SALVAGE: Recovery of useful items repurposing without the need for remanufacturing or reducing to raw materials due to their intrinsic value.
- H. SOLID WASTE DISPOSAL FACILITY: A managed landfill, regulated at the Federal, State, and/or Local level.

#### 1.04 INTENT

- 01. The Project shall generate the least amount of Demolition and Construction debris as practical. The Contractor shall develop and employ processes that ensure that the amount of demolition and construction debris actually generated during the execution of this project due to error, poor planning, breakage, mishandling, contamination, or other factors is minimized.
- 02. Of the construction and demolition debris generated, as much as is economically feasible shall be reused, salvaged, or recycled. Disposal of construction and demolition debris in solid waste disposal facilities shall be minimized to the greatest extent practical but at a minimum shall be consistent with the percentage goal stated herein.
- 03. The Contractor shall develop, for the Owner's review, a Construction Waste Management Plan (CWMP) for this Project.
- 04. Contractor shall be responsible for ensuring that construction and demolition debris, not otherwise salvaged or recycled will be disposed of at appropriately licensed solid waste disposal facilities.

#### 1.05 SUBMITTALS

- A. Construction Waste Management Plan (CWMP): Within 45 calendar days after receipt of Notice to Proceed, the Contractor shall provide a plan for review by the owner. The Construction Waste Management Plan shall be uploaded in the format provided on the University of Missouri FP&D website link:

[https://collaborate.umsystem.edu/sites/fpd/\\_layouts/15/WopiFrame.aspx?sourcedoc={2B743FEC-E36D-467A-A159-3D8B82D6E47F}&file=Const%20Waste%20Management%20Worksheet.xls&action=default](https://collaborate.umsystem.edu/sites/fpd/_layouts/15/WopiFrame.aspx?sourcedoc={2B743FEC-E36D-467A-A159-3D8B82D6E47F}&file=Const%20Waste%20Management%20Worksheet.xls&action=default)

and shall at a minimum contain the following:

- 1. Analysis of the proposed jobsite waste to be generated, including types and estimated quantities.
- 2. Solid Waste Disposal Facility Options: The name of the facilities landfills where construction and demolition debris not otherwise salvaged or recycled will be disposed of, the applicable landfill tipping disposal fees, and the projected cost of such disposal.
- 3. Solid Waste Disposal Facility Certification: Contractor's statement of verification that facilities proposed for use are licensed for types of waste to be deposited and have sufficient capacity to receive waste from this project.

4. Recycling Facility Options: Facilities providing commingled or mixed-stream recycling must provide diversion rates either specific to the project, or an average diversion rate that is regulated by the local or state authority. The average recycling rate for the facility must exclude ADC. Measurements must be based on weight (not volume), using scales. Reporting increments shall be no more than annually and must use consistent time increments throughout calculations.
  5. Alternatives: A list of each material proposed to be salvaged or recycled during the course of the Project and the planned reuse strategy or diversion destination of each. Include the following and any additional items proposed:
    - a. Cardboard
    - b. Clean wood
    - c. Beverage containers
    - d. Concrete
    - e. Slurry wall materials
    - f. Bricks and masonry
    - g. Asphalt
    - h. Metals from framing, banding, stud trim, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized sheet steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze
    - i. Mechanical and electrical equipment
    - j. Building components which can be removed relatively intact from existing construction
    - k. Packaging materials
    - l. Glass
    - m. Scraps from new gypsum wall board
    - n. Carpet and pad
    - o. Acoustical ceiling panels
    - p. Plastics
  6. Meetings: A description of the regular meetings to be held to ensure proper execution of the construction waste management plan.
  7. Debris Handling Procedures: A description of the means by which any construction waste materials identified above will be protected from contamination, and a description of the means to be employed in recycling the above materials consistent with requirements for acceptance by designated facilities.
  8. Transportation: A description of the means of transportation of the debris (whether debris will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site).
- B. Waste Management Progress Report: Concurrent with each Application for Payment, submit a written Waste Management Progress Report in the same format as required for Final Report. Submission of this report shall be a prerequisite to the Owner's approval of the Contractor's application for Payment. Provide a statement indicating original estimated total diversion rate, diversion to date, and expected final diversion rate. Include narrative regarding discrepancies or activity since the previous report.

- C. Waste Management Final Report: Within five (5) Calendar Days of Substantial Completion, submit a written Construction Waste Management Final Report summarizing the types and quantities of materials recycled, salvaged, and disposed of under the Construction Waste Management Plan. This report shall be in the same format as the monthly reports. Include the name and location of disposal facilities. Quantities must be reported by weight and consistent in units reported and calculation method throughout. The Construction Waste Management Final Report shall be submitted using the Owner's information sharing website Projex, unless directed otherwise - Waste Management Log and include the following:
1. Material category
  2. Generation point
  3. Total quantity of waste by category
  4. Total quantity of waste reused
  5. Total quantity of waste salvaged, both estimated and actual
  6. Total quantity of waste recycled, both estimated and actual
  7. Total quantity of waste diverted (salvaged and recycled)
  8. Total quantity of waste diverted (salvaged and recycled) as a percentage of total waste
- D. Other Submittals:
1. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations.
  2. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations.
  3. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
  4. Landfill Disposal Records: Indicate receipt and acceptance of waste by landfills facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
  5. Wood Derived Fuel Processing Facility Records: Indicate receipt and acceptance of materials by (WDF) processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
  6. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

## **PART 2 PRODUCTS (NOT USED)**

### **PART 3 EXECUTION**

#### **3.01 ON-SITE OPERATIONS**

- A. Manager: The Contractor shall designate an on-site person responsible for instructing workers and overseeing and documenting results of the Waste Management Plan for the Project.
- B. Distribution: The Contractor shall distribute copies of the Waste Management Plan to the Job Site Foreman, each Subcontractor, and the Owner's Representative.
- C. Instruction: The Contractor shall provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the Project.

- D. Separation Facilities: The Contractor shall lay out and label a specific area to facilitate separation of materials for recycling, salvage, and return. Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid contamination of materials. Location shall be acceptable to the Owner's Representative.
1. Commingling Waste: Commingling waste at the job site may be allowed, provided that the following conditions are met:
- a. Comminglers shall be included in the Construction Waste Management Plan (CWMP)
  - b. Additional comminglers must be pre-approved by the Architect via CWMP addenda, prior to tipping on the job site.
- E. Hazardous Wastes: Any unforeseen hazardous wastes shall be separated, stored, and disposed of according to local regulations and as directed by the Owner.

**END OF SECTION**



# Construction Waste Management REPORT

## Recycled, Diverted, and Reused Materials - ACTUAL

Matl. Stream	Date	Diversion Method / Location	Receipt #	Notes (Material)	Source	Units	Cubic Feet	Square Feet	Lineal Feet	Per Unit (lbs)	Weight (lbs)	Total Stream Weight (lbs)
<b>Concrete Rubble</b>												<b>0.00</b>
	mm/dd/yyyy	eg: Clean Fill		eg: Somename Rd.	eg: Demolition						0.00	
											0.00	
<b>Dimensional Lumber and Wood Cut Pieces</b>												<b>0.00</b>
	mm/dd/yyyy	eg: ACME Inc. Compost		eg: misc wood	eg: Demolition						0.00	
											0.00	
<b>Clean Gypsum Wallboard</b>												<b>0.00</b>
	mm/dd/yyyy	eg: ACME Inc. Compost		eg: gyp board	eg: Demolition						0.00	
											0.00	
<b>Doors &amp; Frames</b>												<b>0.00</b>
	mm/dd/yyyy	eg: SomeGroup Donation		eg: wood trim	eg: Demolition						0.00	
											0.00	
<b>Steel</b>												<b>0.00</b>
	mm/dd/yyyy	eg: ACME Inc. Recycling		eg: steel	eg: Demolition						0.00	
											0.00	
<b>Cardboard &amp; Paper</b>												<b>0.00</b>
	mm/dd/yyyy	eg: ACME Inc. Recycling		eg: pkg boxes							0.00	
											0.00	
<b>Scrap Metal</b>												<b>0.00</b>
	mm/dd/yyyy	eg: ACME Inc. Recycling		eg: zinc/steel	eg: Demolition						0.00	
											0.00	
<b>Carpet &amp; Padding</b>												<b>0.00</b>
	mm/dd/yyyy	eg: ACME Carpeting & Flooring		eg: carpet	eg: Demolition						0.00	
											0.00	
<b>Casework</b>												<b>0.00</b>
	mm/dd/yyyy	eg: University Salvage		eg: casework	eg: Demolition						0.00	
											0.00	
<b>Miscellaneous Equipment</b>												<b>0.00</b>
	mm/dd/yyyy	eg: ACME International Inc.		eg: misc	eg: Demolition						0.00	
											0.00	

ACTUAL Total Waste Diverted **0.00** (lbs)

# Construction Waste Management REPORT

## Landfill Materials Description - ACTUAL

Matl. Stream	Date	Diversion Method / Location	Receipt #	Notes (Material)	Source	Units	Cubic Feet	Square Feet	Lineal Feet	Per Unit (lbs)	Weight (lbs)	Total Stream Weight (lbs)
<b>General Mixed Waste</b>												<b>0.00</b>
	mm/dd/yyyy	eg: ACME International Inc.		eg: misc	eg: Demolition						0.00	
											0.00	
<b>Alternative Daily Cover</b>												<b>0.00</b>
	mm/dd/yyyy	eg: ACME International Inc.		eg: misc	eg: Demolition						0.00	
											0.00	

ACTUAL Total Waste to Landfill 0.00 (lbs)

Total Construction Waste - ACTUAL

0.00

Percentage of Waste Diverted From Landfill - ACTUAL

0.00%

## SECTION 020810

### UNIVERSAL WASTES/OTHER ENVIRONMENTAL CONCERNS REMOVAL AND DISPOSAL

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#### **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 incineration/disposal of the following approximate quantities of Universal Waste materials and other Environmental Concerns for the Mizzou North Demolition Project – Project #CP219078:

- 7,800 each of fluorescent light bulbs
- 2,100 each of light ballasts containing PCBs
- 125 each of smoke detectors
- 10 each of door closures
- 170 each of thermostats
- 230 each of fire alarms
- 25 each of emergency lights
- 25 each of water coolers
- 160 each of exit signs
- 60 each of fire extinguishers
- 350 units of electronic waste
- 5 each of refrigerators
- 5 each of Air Conditioning Window Units
- 250 containers of paints/solvents
- 150 containers of discarded chemicals located in Rooms 50, 201, 322, 1037, and 1042
- 10 each of compressed gas cylinders
- 5 each of elevator pistons with hydraulic fluid
- One each of 3,000 gallon Above Ground Storage Tank (AST), associated with the back-up generator
- 3 each of 1,500 gallon ASTs, associated with the back-up generator
- 5 each of air compressors
- 2 each of bio-waste containers in Room 50

## SECTION 020810

### UNIVERSAL WASTES/OTHER ENVIRONMENTAL CONCERNS REMOVAL AND DISPOSAL

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49 each of batteries

Pieces of 2 MRI units in Room 50

One each of a lead waste crucible

#### 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 universal and hazardous removal work or hauling and disposal of such waste materials include but are not limited to the following:

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

## SECTION 020810

### UNIVERSAL WASTES/OTHER ENVIRONMENTAL CONCERNS REMOVAL AND DISPOSAL

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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 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.

1.1.4 **COORDINATION:** The remediation contractor shall be responsible for the coordination of the universal waste materials removal for this project. The 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.

## SECTION 020810

### UNIVERSAL WASTES/OTHER ENVIRONMENTAL CONCERNS REMOVAL AND DISPOSAL

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#### 1.3 CONTRACTOR USE OF PREMISES

- 1.3.1 **GENERAL:** During the construction period, the remediation contractor will have access to all parts of the building.
- 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. Contractor will be provided locations for parking and/or storage of materials. These locations will be placed to each building as close as possible, without disrupting normal daily MU operations.
- 1.3.2.2 Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage to areas 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 universal or hazardous material 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 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

## SECTION 020810

### UNIVERSAL WASTES/OTHER ENVIRONMENTAL CONCERNS REMOVAL AND DISPOSAL

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premises.

#### 1.4 OWNER OCCUPANCY

**1.4.1 PARTIAL OWNER OCCUPANCY:** The Owner reserves the right to occupy areas of the building in which universal waste 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 universal and hazardous waste 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 or Air Sampling Firm (one copy for the Owner's Representative). The Owner's C.I.H. or Air Sampling Firm will return reviewed copies to contractor and Owner's Representative.

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, if applicable

2.1.2.3 Physician's Statement that each person is physically fit to wear a respirator, if respirator use is required

2.1.2.4 Respirator Fit Test, if respirator use is required

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.

2.1.4 Proposed disposal/incineration site for universal waste 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 universal waste material removal, submit to the Owner's Representative, copies of hazardous materials shipping records, disposal receipts, incineration documentation, etc. for all universal waste materials removed from the project site.

## SECTION 020810

### UNIVERSAL WASTES/OTHER ENVIRONMENTAL CONCERNS REMOVAL AND DISPOSAL

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- 2.1.7 Upon completion of the universal waste material removal, the following information shall be submitted by the contractor to the Owner's C.I.H. or Air Sampling Firm:
- 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 or Air Sampling Firm that universal waste materials 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 construction and demolition 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 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 waste materials. The proposed disposal containers for universal wastes will be provided to the Owner's Representative as part of the remediation contractor's pre-work submittals.
- 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 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 universal/hazardous waste materials are required to be handled. The area is designated as a work area



## SECTION 020810

### UNIVERSAL WASTES/OTHER ENVIRONMENTAL CONCERNS REMOVAL AND DISPOSAL

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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 the universal waste 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.

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.

## SECTION 020810

### UNIVERSAL WASTES/OTHER ENVIRONMENTAL CONCERNS REMOVAL AND DISPOSAL

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- 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 universal waste/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 Federal, State, and Local regulations and the 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.

### 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.
  - 3.3.1.4 Vacuums: Use HEPA type from a known manufacturer.
  - 3.3.1.5 Other tools and equipment as necessary.

### 3.4 SUPERVISION OF UNIVERSAL WASTES MATERIAL 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:

## SECTION 020810

### UNIVERSAL WASTES/OTHER ENVIRONMENTAL CONCERNS REMOVAL AND DISPOSAL

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- 3.4.1.1 Be knowledgeable in all aspects of removal, cleanup and proper disposal of universal waste/hazardous materials 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
- 3.5.2 All workers shall be trained in the dangers inherent in handling universal waste, and hazardous materials, in proper work procedures, and personal protective measures.

### 3.6 OWNER'S CERTIFIED INDUSTRIAL HYGIENIST/AIR SAMPLING FIRM

- 3.6.1 It will be the Owner's responsibility to hire a Certified Industrial Hygienist or Air Sampling Firm or use an In-House Certified Industrial Hygienist. The Certified Industrial Hygienist/Air Sampling 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.

## SECTION 020810

### UNIVERSAL WASTES/OTHER ENVIRONMENTAL CONCERNS REMOVAL AND DISPOSAL

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#### 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

- 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 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) 10 lb 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 The contractor shall maintain the work area free from rubbish, debris, and dirt,

## SECTION 020810

### UNIVERSAL WASTES/OTHER ENVIRONMENTAL CONCERNS REMOVAL AND DISPOSAL

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and keep a clean, safe working area.

#### 3.10 UNIVERSAL WASTE/HAZARDOUS MATERIALS REMOVAL OPERATIONS

- 3.10.1 Any light fixtures, housings, etc. (Non-Universal Wastes), concealing items considered to be universal waste/hazardous material, shall be removed and left on-site for disposal during the building demolition.
- 3.10.2 **FLUORESCENT LIGHT TUBES** may contain small amounts of Mercury. This can potentially be harmful to human health and the environment. The bulbs should be placed in fiberboard boxes provided by MU EHS to minimize breakage. MU EHS will manage disposal of this material.
- 3.10.3 **POLYCHLORINATED BIPHENYL (PCBS)** are a known carcinogenic material. Its use was discontinued January 1, 1979. Due to the age of the building, it should be assumed that any ballast can contain PCBs unless it is labeled as PCB free by the manufacturer. Due to this, any light ballasts presumed to contain PCBs should be properly disposed. MU Environmental Health Safety will provide collection containers for this purpose. Non-PCB ballasts will also be managed by MU Environmental Health Safety. Collection containers will be provided to the contractor upon their request.
- 3.10.4 **EXIT SIGNS AND EMERGENCY LIGHTS** typically have backup batteries that may contain small amounts of lead. Some exit signs are powered by a small amount of radioactive material. Powered exit signs and emergency lights should have the battery removed and disposed of by MU Environmental Health and Safety. Non powered exit signs should be assumed to contain radioactive material and should be collected for disposal via MU Environmental Health and Safety. MU Environmental Health and Safety will provide collection containers for these items.
- 3.10.5 **ELEVATOR PISTONS**: Because the elevators are more than likely hydraulic driven, the oil in these components may contain PCBs. The contractor will need to coordinate with MU Safety and Health to determine the types of elevator present and if the oil in the elevator equipment has ever been tested. If not, the oil will either need to be tested or properly drained and disposed of. Coordinate with MU Environmental Health and Safety for collection containers and proper labeling.
- 3.10.6 **DOOR CLOSURES**: Some door closures contain oils that may contain PCBs. These items must be properly labeled, packaged and turned over to MU Environmental Health and Safety for proper disposal. Coordinate with MU Environmental Health and Safety for collection containers and proper labeling.
- 3.10.7 **THERMOSTATS**: Some thermostats may contain small amounts of mercury. These items must be properly labeled, packaged and turned over to MU Environmental Health and Safety for proper disposal. Coordinate with MU Environmental Health and Safety for collection containers and proper labeling.
- 3.10.8 **WATER COOLERS (DRINKING FOUNTAINS)**: These materials may contain small amounts of lead in the reservoir and/or CFCs or HCFCs. These items must be properly labeled, packaged and turned over to MU Environmental Health and Safety for proper disposal. Coordinate with MU Environmental

## SECTION 020810

### UNIVERSAL WASTES/OTHER ENVIRONMENTAL CONCERNS REMOVAL AND DISPOSAL

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Health and Safety for collection containers and proper labeling.

- 3.10.9 **ELECTRONIC WASTES:** Some electronic wastes may contain heavy metals which must be disposed of properly. Due to the type of materials present, the disposition of these items will need to be coordinated with MU. These items must be properly labeled, packaged and turned over to MU Environmental Health and Safety for proper disposal. Coordinate with MU Environmental Health and Safety for collection containers and proper labeling.
- 3.10.10 **REFRIGERATORS:** Refrigerators may contain CFCs and/or HCFCs which must be disposed of properly. Due to the type of materials present, the disposition of these items will need to be coordinated with MU. These items must be properly labeled, packaged and turned over to MU Environmental Health and Safety for proper disposal. Coordinate with MU Environmental Health and Safety for collection containers and proper labeling.
- 3.10.11 **A/C WINDOW UNITS:** A/C Units may contain CFCs and/or HCFCs which must be disposed of properly. Due to the type of materials present, the disposition of these items will need to be coordinated with MU. These items must be properly labeled, packaged and turned over to MU Environmental Health and Safety for proper disposal. Coordinate with MU Environmental Health and Safety for collection containers and proper labeling.
- 3.10.12 **PAINTS/SOLVENTS:** Non-latex paints and solvents may contain various amounts of volatile chemicals and must be disposed of properly. These items must be properly labeled, packaged and turned over to MU Environmental Health and Safety for proper disposal. Coordinate with MU Environmental Health and Safety for collection containers and proper labeling.
- 3.10.13 **FIRE ALARMS:** Some fire alarms may contain small amounts of radioactive material. These should be collected, packaged and properly labeled for disposal via MU Environmental Safety and Health. Coordinate with MU Environmental Health and Safety for collection containers and proper labeling.
- 3.10.14 **ABOVE GROUND STORAGE TANK (AST):** These tanks appear to be an old oil tank and may contain remnants of oil. The contractor will need to coordinate with MU Safety and Health to determine if the oil has ever been tested. If not, oil and ASTs will need to be properly drained and disposed of. Coordinate with MU Environmental Health and Safety for collection containers and proper labeling.
- 3.10.15 **COMPRESSED GAS CYLINDERS:** The contractor will need to coordinate with MU Safety and Health to determine if these cylinders can be reused. Otherwise, these cylinders will need to be properly drained and disposed of. Coordinate with MU Environmental Health and Safety for collection containers and proper labeling.
- 3.10.16 **UNUSED CHEMICALS:** Unused chemicals are found in various areas in this facility. These chemicals will need to be characterized, possibly recontainerized, labeled, and properly disposed of. Coordinate with MU Environmental Health and Safety for collection containers and proper labeling.

## SECTION 020810

### UNIVERSAL WASTES/OTHER ENVIRONMENTAL CONCERNS REMOVAL AND DISPOSAL

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- 3.10.17 **AIR COMPRESSORS:** These air compressors may have oils that could contain PCB. These items must be properly labeled, packaged and turned over to MU Environmental Health and Safety for proper disposal.
- 3.10.18 **BIO-WASTE CONTAINERS:** It is anticipated that these containers will be turned over to MU EH&S or their designated party for the proper disposal. The remediation contractor will not be responsible for disposal of these containers.
- 3.10.19 **BATTERIES** may contain lead. These batteries shall be properly packaged, labeled and incinerated/disposed. Coordinate with MU EH&S for packaging, labeling and incineration/disposal.
- 3.10.20 **MRI UNITS:** There are pieces of MRI units present in Room 50. It is not known if there are parts that have radioactive components or not. If present, these items are governed by the Nuclear Regulatory Commission (NRC) and the USEPA Office of Air and Radiation (OAR). The removal of these items must be carefully coordinated with them and MU EH&S. Coordination with MU EH&S is a must for this portion of the project.
- 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. or Air Sampling Firm documenting that the universal/hazardous waste materials have been removed from the project site.

**END OF SECTION**

**SECTION 02 4100  
DEMOLITION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Building demolition .
- B. Abandonment and removal of existing utilities and utility structures.

**1.02 RELATED REQUIREMENTS**

- A. Section 00 1.C - Report for Hazardous Materials Survey and Limited RCRA Metals Survey
- B. Section 00 1.C - In-Place Closure Report (Diesel Storage Tanks)
- C. Section 00 1.E – Special Conditions: Site fences, security, protective barriers, and waste removal.
- D. Section 01 7419 – Construction Waste Management.
- E. Section 02 1810 - Technical Specifications - Universal/Hazardous Materials Removal and Disposal.
- F. Section 02 8233 – Technical Specifications: Asbestos Containing Materials Removal and Disposal

**1.03 REFERENCE STANDARDS**

- A. 29 CFR 1926 - Safety and Health Regulations for Construction Current Edition.
- B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2019.

**1.04 SUBMITTALS**

- A. See Division One for submittal procedures.
- B. Demolition Plan: Submit demolition plan as specified by OSHA, and as follows:
  - 1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
  - 2. Identify demolition firm.
  - 3. Include a summary of safety and protection procedures.
  - 4. Indicate on drawings the protection measures proposed for protecting individuals and property, environmental protection, dust control, and noise control.
- C. Schedule of Building Demolition Activities:
  - 1. Detailed sequence of demolition work with starting and ending dates for each activity.
  - 2. Note any anticipated dates of interruption of utilities.
  - 3. Shutoff and capping or re-routing of utilities.
- D. 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.
- E. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

**1.05 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-Demolition Meeting: Convene a pre-demolition meeting one week before starting work of this section; require attendance by all relevant personnel. Maintain and submit minutes of meeting.
  - 1. Inspect and discuss condition of construction to be demolished.
  - 2. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities required to make progress and avoid delays.
  - 3. Review and finalize protection requirements.



4. Review procedures for noise and dust control.
5. Review items to be salvaged and returned to Owner.

#### **1.06 PROJECT CONDITIONS**

- A. Building will be vacated, and its use discontinued before the start of work.
- B. Regulated Construction and Demolition Waste: Regulated construction and demolition wastes are present in the portions of the building to be selectively demolished. Reports on the presence of regulated construction and demolition wastes are included in Division One. Examine reports to become aware of locations where regulated construction and demolition wastes are present.
- C. On-site storage or sale of removed items or materials is not permitted.

#### **1.07 QUALITY ASSURANCE**

- A. 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 building and associated infrastructure as indicated on the Project Documents.
- B. Remove foundation walls, footings, and piers in their entirety.
- C. Remove other items indicated, for salvage and/or recycling.
- D. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in other Sections.

#### **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. Do not begin removal until built elements to be salvaged or relocated have been removed.
- E. 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.
- F. 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.
- G. Hazardous Materials: Comply with 29 CFR 1926 and state and local regulations.
- H. If undocumented 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.
- I. Perform demolition in a manner that maximizes salvage and recycling of materials.
  - 1. Dismantle existing construction and separate materials.
  - 2. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.
- J. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

### **3.03 EXISTING UTILITIES**

- A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.
- E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.
- F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
- G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.
- H. Prepare demolition area by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

### **3.04 DEBRIS AND WASTE REMOVAL**

- A. Remove debris, junk, and trash from site.
- B. Remove from site all materials not to be reused on site; comply with requirements of Section 01 7419 – Construction Waste Management.
- C. Leave site in clean condition, ready for subsequent work.
- D. Clean up spillage and wind-blown debris from public and private lands.

**END OF SECTION**

FRIABLE AND NON-FRIABLE ASBESTOS REMOVAL

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**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 materials, 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 including.

A. Friable asbestos:

The contractor shall remove and legally dispose of the following friable asbestos-containing materials for the Mizzou North Building – Project No. CP219078:

- Approximately 10,000 linear feet of pipe and pipe fitting insulation located in the main boiler room and within pipe chases in all rooms and restrooms on each floor.
- Electrical Wiring – located throughout stairwells – approximately 500 linear feet (estimated)

B. Non-Friable asbestos:

The contractor shall remove and legally dispose of the following non-friable asbestos-containing materials for the Mizzou North Building – Project No. CP219078:

Floor Tile and Mastic, 12" x 12"

- 12" by 12" White Floor Tile with Black Specks and Black Mastic – located in Rooms 2018, C3000, C3001, C3002, C3003, C3004, C3005, 3007, 3007A, 3007B, 3008, 3008A, 3009, 3014, 3016, 3018, 3021, 3022, 3023, 3026, 3028A, 3028B, 3034, 3035A, 3036, 3038, 3040, 3041, 3043A - approximately 8,600 square feet

## SECTION 028233

### FRIABLE AND NON-FRIABLE ASBESTOS REMOVAL

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- 12" by 12" Grey Floor Tile with White and Dark Grey Mottles – located in Rooms C001, 27I, 68B, 70A, 416B, 421B, 521, 705 - approximately 2,000 square feet
- Black Floor Mastic under 12" x 12" Tan with White Mottles Floor Tile – located in Rooms 8, 8A, 8B, 8C, 62, 107B, 208, 209, 210, 211, 212, 214, 215, 217, 218, 219, 220, 221, 222, 2018, 2018B, 2018C, 2042, 302, 307, 307A, 308, 308A, 310, 311, 311A, 312, 312A, 314, 314A, 315, 317, 317A, 318, 318A, 319, 319A, 321, 321A, 322, 322A - approximately 9,800 square feet
- Black Floor Mastic under 12" x 12" Red Floor Tile – located in Rooms 208, 208B1, 209, 209B, 210, 211, 212, 214, 215, 217, 218, 219, 221, 222, 2018 - approximately 4,700 square feet
- 12" by 12" White Floor Tile with Dark Tan and Light Blue Streaks and Yellow and/or Black Mastic – located in Rooms 1002D, 1016, 1038, 1039, 1042, 1043, 1046, 1046A, 1046B, 1046C, 1046D, 1046E, 1046F, C2000, C2003, 2005, 2014, 2014A, 2014B, 2014C, 2014D, 2014E, 2014F, 2014G, 2014H, 2014I, 2018, 2018A, 2020, 2024, 2055, 2056, 504 - approximately 11,700 square feet
- Black Floor Mastic under 12" x 12" Black with White Streaks Floor Tile – located in Rooms 215, 2018, 3010, 3011, 3012, 3012A, 3015, 3017, 3019, 3020, 3027, 3029, 3030, 3031, 3032, 3033, 3035, 3037, 3043B, 3044, 3045, 3046, 3048, 3050 - approximately 7,100 square feet
- Yellow Floor Mastic under 12" x 12" Tan with Light Blue Streaks Floor Tile – located in Rooms C2000 - approximately 1,600 square feet
- Yellow Floor Mastic under 12" x 12" Black Floor Tile – located in Rooms C2000, C3000, 302, 307, 308, 310, 311, 312, 314, 315, 317, 318, 319, 321, 322 - approximately 5,600 square feet
- 12" by 12" Teal Floor Tile with White Streaks and Black Mastic – located in Rooms 2002, 2002A, 2006A, 2006B, 2007, 2021A, 2021B, 2021C, 2022B - approximately 1,200 square feet
- 12" by 12" White Floor Tile with Dark Tan Streaks and Black Mastic – located in Rooms 39J, 45A, 607, 608 - approximately 7,500 square feet
- 12" by 12" Cream Floor Tile with Brown Speckles and Black Mastic – located in Rooms C003, C006, C007, C033, 14A, 15, 23, 26B, 32, 32A, 32A1, 32B, 32C, 32D, 32E, 32F, 34A, 35A, 36, 36A, 39K, 39N, 39P, 39Q, 41, 41A, 42B, 43, 44, 52, C105, C106, C1000, C1001, C1002, C1003, C1004, C1078, 120, 122, 122A, 1002, 1002A, 1002C, 1002E, 1004, 1006B, 1006C, 1006D, 1022, 1023, 1024, 1045, 1045A, 1057, 1072, 1072A, 1072B, 1072C, 1076, C600, C601, C602, 600, 601, 602A, 609, 613, C700, C700A, C700B, C706, 701, 704, 704A, 704B, 704C, 704D, 705, 705A, 706, 706C1, 706E, 707A, 707B - approximately 26,000 square feet
- Black Floor Mastic under 12" x 12" Light Blue with Blue and Green Streaks Floor Tile – located in Rooms C1005, C1005A, 125, 126, 127, 128, 129, 132, 141, 143, 145, 148, 1048, 1049, 1050, 1051, 1052, 1054, 1054A, 1054B, 1054C, 1054D, 1061, 1062, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 2038, 327, 705, Elevators - approximately 7,100 square feet
- Black Floor Mastic under 12" x 12: Light Blue with Mottles Floor Tile –

## SECTION 028233

### FRIABLE AND NON-FRIABLE ASBESTOS REMOVAL

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- located in Rooms C001, 1, 8C, 10, 11, 12, 54, 55, 56, 608 - approximately 3,000 square feet
- Black Floor Mastic under 12" x 12" Dark Blue with Mottles Floor Tile – located in Rooms 125, 126, 127, 128, 129, 132, 134, 135, 136, 137, 138, 139, 140A, 140B, 141, 142, 142A, 143, 145, 148, 1048, 1049, 1050, 1051, 1052, 1054, 1054A, 1054B, 1054C, 1054D, 1061, 1062, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 521, Elevators - approximately 7,200 square feet
- Black Floor Mastic under 12" x 12" Light Blue with Black Speckles Floor Tile – located in Rooms 2008, 2018, 2020 - approximately 1,700 square feet
- Yellow Floor Mastic under 12" x 12" Blue with Dark Blue Streaks Floor Tile – located in Rooms 125, 126, 127, 128, 129, 132, 141, 143, 145, 148, 1048, 1049, 1050, 1051, 1052, 1054, 1054A, 1054B, 1054C, 1054D, 1061, 1062, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071 - approximately 5,400 square feet
- Yellow Floor Mastic White with Brown Streaks Floor Sheetting – located in Rooms 53G, 71A, 71B, 1031, 1032, 1033, 1034, 1035, 1036, 1037 - approximately 1,300 square feet

#### Floor Tile and Mastic, 9" x 9"

- 9" by 9" White Floor Tile with Grey and Black Streaks – located in Rooms 224, 225, 226, C300, C301, C302, 304, 315, 325, 326, C401, C402, 402, 402B, 408, 408A, 408A1, 408A2, 408B, 408C, 408D, 408E, 410, 411, 412, 414, 415, 416, 417, 419D, 421, 421A, 421C, 421E, 421F, 421H, 424, 424A, 424B, 505 - approximately 8,300 square feet
- 9" by 9" Grey Floor Tile with White Streaks – located in Rooms C401, C402, 402, 402B, 405, 408, 408A, 408A1, 408A2, 408B, 408C, 408D, 408E, 410, 411, 412, 414, 415, 419D, 421, 421A, 421C, 421E, 421F, 421H - approximately 4,300 square feet
- 9" by 9" Black Floor Tile with White Streaks – located in Rooms 54, 55, 56, C401, C402, 402, 402B, 408, 408A, 408A1, 408A2, 408B, 408C, 408D, 408E, 410, 411, 412, 414, 415, 417, 419D, 421, 421A, 421C, 421E, 421F, 421H, 3037 - approximately 5,500 square feet
- 9" by 9" Brown Floor Tile with Mottles and Black Mastic – located in Rooms 501, 501A, 507, 508, 509, 510, 511, 512, 514, 517, 518, 518A, 519, 522, 524, 525, C800, 804, S800C - approximately 4,300 square feet

#### Ceiling Tile Adhesive

- Dark Brown Ceiling Tile Adhesive – located in Rooms Western portion of the 1st floor, C200, C200A, C201, C202, C600, C601, C602, 603, 608 – approximately 10,000 square feet

#### Sink Undercoating

- Black Sink Undercoating – located in Rooms 33, 34F, 301, 3011,

## SECTION 028233

### FRIABLE AND NON-FRIABLE ASBESTOS REMOVAL

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3015, 3017, 3018, 3024, 3027, 3032, 3035, 3042, 3043C, 3045, 3046,  
600 – approximately 16 each

#### Fume Hoods

- Fume Hoods – located in Rooms 3011, 3015, 3017, 3027, 3030 - 6 each

#### Countertops

- Countertops – located in Rooms 3011, 3012, 3015, 3017, 3020, 3024, 3027, 3030, 3033, 3035, 3037, 3042, 3043B, 3043C, 3045, 3046 - 16 each

#### Fire Doors

- Fire Doors – located throughout the Mizzou North Building – approximately 200 each

See the attached drawings for the general locations of these asbestos-containing materials.

## 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 particulates.
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 Material (ACM) - Any material containing more than 1 percent asbestos.
8. 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.

## SECTION 028233

### FRIABLE AND NON-FRIABLE ASBESTOS REMOVAL

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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.
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.

## SECTION 028233

### FRIABLE AND NON-FRIABLE ASBESTOS REMOVAL

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21. Glove Bag - A manufactured or fabricated device, typically constructed of six (6) mil transparent polyethylene or polyvinyl chloride plastic. This device consists 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.

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 must be a State of Missouri certified Asbestos Air Sampling Professional 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 must have a State of Missouri asbestos 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.



## SECTION 028233

### FRIABLE AND NON-FRIABLE ASBESTOS REMOVAL

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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.

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

SECTION 028233

FRIABLE AND NON-FRIABLE ASBESTOS REMOVAL

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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.

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:

Department of Natural Resources

SECTION 028233

FRIABLE AND NON-FRIABLE ASBESTOS REMOVAL

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Air Pollution Control Program (Asbestos)  
P.O. Box 176  
Jefferson City, Missouri 65102

U.S. Environmental Protection Agency  
Region VII  
Air & Toxic Division, Air Branch  
ATTN: Air Compliance  
726 Minnesota Avenue  
Kansas City, Kansas 66101

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. 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.

## SECTION 028233

### FRIABLE AND NON-FRIABLE ASBESTOS REMOVAL

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4. Provide a disposal plan to detail type of disposal container, method of 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.

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 Air Sampling Firm 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 Air Sampling Firm.

#### **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

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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 Air Sampling Firm. Inspection shall be documented.

**3.2 NEGATIVE INITIAL EXPOSURE ASSESSMENT**

1. The Contractor must conduct an 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 measures.

FRIABLE AND NON-FRIABLE ASBESTOS REMOVAL

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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. 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 or 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 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.

2. Emergency protection plan shall also include written notification of police, fire and

## SECTION 028233

### FRIABLE AND NON-FRIABLE ASBESTOS REMOVAL

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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, clients, or the public, barriers 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. 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.
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 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 Air Sampling Firm to perform a visual inspection. When the Owner's Air

FRIABLE AND NON-FRIABLE ASBESTOS REMOVAL

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Sampling Firm feels the area is ready based on the results of their visual inspection, the Contractor shall apply a lockdown encapsulant. Following application of lockdown encapsulant, the Owner's Air Sampling Firm shall perform the final clearance sampling for airborne fiber concentrations.

2. The Owner's Air Sampling Firm or designee will perform final clearance testing per the following requirements:

1. Aggressive sampling shall 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 analyzed by an accredited registered microscopist.

3. For areas 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 Air Sampling Professional shall provide a written report of the air monitoring activities to the contractor within 7 days after the final clearance testing.

**3.9 FINAL CLEARANCE REQUIREMENTS (NONFRIABLE 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 Air Sampling Firm to perform a visual inspection. When the Owner's Air Sampling Firm feels the area is ready based on the results of their visual inspection, the Owner's Air Sampling Firm will perform the final clearance sampling for airborne fiber concentrations.

2. The Owner's Air Sampling Firm or designee will perform final clearance testing per the following requirements:

1. Aggressive sampling shall 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 analyzed by an accredited registered microscopist.

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 Air Sampling Firm shall provide a written report of the air monitoring activities to the contractor within 7 days after the final clearance testing.



FRIABLE AND NON-FRIABLE ASBESTOS REMOVAL

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**3.10 REESTABLISHMENT OF THE WORK AREA AND SYSTEMS**

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.

**3.11 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. Each bag 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.

**3.12 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.

**3.13 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.

August 12, 2022

Ms. Pamela Eugster, R.A.  
Campus Facilities – Planning, Design & Construction  
University of Missouri  
E111 General Services Building  
Columbia, Missouri 65211

ATTN: Ms. Pamela Eugster, R.A.  
Email: [eugsterpj@missouri.edu](mailto:eugsterpj@missouri.edu)

RE: **Report for Hazardous Materials Survey and Limited RCRA Metals Survey**  
*Mizzou North Building Demolition – MU Project Number CP219078*  
115 Business Loop 70 W  
Columbia, Missouri 65211  
**PSI Project Number: 0029-5291, Revision 1**

Dear Ms. Eugster:

In accordance with our agreement, Professional Service Industries, Inc., (PSI), an Intertek company, has conducted a Hazardous Materials Survey and a limited RCRA Metals Survey for the Mizzou North Building located at 115 Business Loop 70 W in Columbia, Missouri. 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 'Matthew Basch'.

Matthew Basch  
IH/Environmental Services

A handwritten signature in blue ink that reads 'Greg Chambliss'.

Greg Chambliss, RPIH, LEED AP  
Department Manager

Enclosures



# HAZARDOUS MATERIALS SURVEY AND LIMITED RCRA METALS SURVEY REPORT

*For*

**MIZZOU NORTH BUILDING  
MU PROJECT NUMBER: CP219078  
115 Business Loop 70 W  
Columbia, Missouri 65211**

*Prepared for*

**Campus Facilities  
University of Missouri  
E111 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: 0029-5291, REVISION 1**

**August 12, 2022**



A handwritten signature in black ink that reads "Austin Green".

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Austin Green  
MDNR Asbestos Inspector  
Cert. No.: 7118010522MOII21989

A handwritten signature in blue ink that reads "Matthew Basch".

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Matthew Basch  
MDNR Asbestos Inspector  
Cert. No.: 711808062MOIR12911

A handwritten signature in blue ink that reads "Greg Chambliss".

---

Greg Chambliss, RPIH, LEED AP  
Department Manager  
MDNR Asbestos Inspector  
Cert. No.: 7118122221MOIR323



## TABLE OF CONTENTS

1.0 INTRODUCTION.....	1
1.1 General Information .....	1
1.2 Authorization .....	1
1.3 Purpose .....	1
2.0 SCOPE OF SERVICES .....	2
2.1 Scope of Work.....	2
2.2 Sampling Guidelines.....	2
3.0 METHODOLOGY .....	4
3.1 General References.....	4
3.2 Visual Inspection .....	4
3.2.1 Homogeneous Material Classifications .....	4
3.3 Sampling Procedures .....	4
3.4 Quantification .....	5
3.5 Laboratory Procedures .....	5
3.5.1 Method of Analysis .....	5
3.5.2 Laboratory Quality Control Program .....	5
3.6 RCRA Metals Field Testing .....	5
3.7 Report Formats .....	6
3.7.1 Report Format for Asbestos Table.....	6
3.7.2 Report Format for RCRA Metals Testing Data Results Table.....	7
4.0 FINDINGS AND RECOMMENDATIONS .....	8
4.1 Asbestos Survey Summary.....	8
4.2 Asbestos Survey Summary - Whole Building .....	15
4.3 RCRA Metals Field Testing Summary .....	16
4.4 Universal Wastes Survey Summary .....	17
4.5 Additional Considerations.....	19
5.0 WARRANTY.....	20
APPENDICES	
APPENDIX A - Asbestos Laboratory Results and Chain of Custody Forms	
APPENDIX B - TABLE 1 - RCRA Metals Test Data Results	
APPENDIX C - Floor Plans with Approximate Locations of Confirmed Asbestos-Containing Materials	
APPENDIX D - Personnel/Laboratory Accreditations	



## **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 and a limited Resource Conservation and Recovery Act (RCRA) metals sampling for the Mizzou North Building located at 115 Business Loop 70 W in Columbia, Missouri for the Mizzou North Building Demolition – MU Project Number CP219078.

The Mizzou North Building consists of eight (8) floors with a ground floor and a mezzanine mechanical level, and comprises approximately 223,335 square feet.

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. Pamela Eugster of the University of Missouri via University of Missouri General Consulting Agreement, dated January 28, 2022.

PSI was escorted throughout the Mizzou North Building by University of Missouri maintenance personnel.

### **1.3 PURPOSE**

The purpose of the survey was to determine the presence of asbestos, universal waste materials, and RCRA metals prior to the planned demolition of the Mizzou North Building.



## 2.0 SCOPE OF SERVICES

### 2.1 SCOPE OF WORK

As part of this project, the following services were performed:

- Asbestos Survey and Sampling
- Limited RCRA Metals 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
  - Door Closures
  - Thermostats
  - Smoke Detectors
  - Electronic Wastes
  - Fire Extinguishers

### 2.2 SAMPLING GUIDELINES

The survey of the Mizzou North 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 building was conducted in accordance with general EPA/AHERA sampling guidelines to determine the presence of suspect asbestos-containing materials (ACM). Mr. Matthew Basch, and Mr. Austin Green, State of Missouri, and EPA accredited asbestos inspectors, performed the asbestos survey.

Samples of suspect asbestos-containing materials were collected from representative areas of the facility, which could be physically entered during the survey.

Samples were sent to Professional Service Industries, Inc.'s (PSI) 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.

PSI performed a walk-through of the building and sampled painted surfaces covering more than 500 square feet of area to determine the presence or absence of the eight (8) RCRA metals on concrete,



brick, and or cinder block to determine if the material can be used as clean fill. Only painted concrete, brick, and cinder blocks were sampled as part of this survey.

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 the Mizzou North Building 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.





PSI was escorted throughout the Mizzou North Building 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.

### **3.6 RCRA METALS FIELD TESTING**

Mr. Matthew Basch, a trained Lead Inspector, used a Thermo Scientific Niton XL2 980 GOLDD X-Ray Fluorescence (XRF) Analyzer (XL2 XRF) to determine the presence and amount of arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver (collectively known as the RCRA 8 Metals) in painted components in the building that might be potentially used as clean fill. This device was used to test for the required parameters and to provide the needed detection limits.

This device provided real-time data regarding the presence of the RCRA metals tested. The data was recorded by the device for later processing.



### 3.7 REPORT FORMATS

#### 3.7.1 Report Format for Asbestos Survey Summary Table

##### Sample Numbers

An alpha numeric number is assigned to each sample to track results. A homogenous area is defined as an area of material that is uniform in color, texture, and age. Each homogenous area was given a distinct letter designation. An example of the numbering sequence is as follows:

##### MN-RS-A-1

MN = Represents the name of the facility (Mizzou North)

RS = Type of material sampled (i.e., Roofing System)

A = Homogeneous Area 'A'

1 = First sample taken from homogeneous area A

##### Description

Describes the material.

##### General Location

Area in the facility where suspect material was found.

##### Asbestos % and Type

Amount and type of asbestos (Any material containing more than 1% asbestos is considered an ACM) or if the material does not contain asbestos (ND = None Detected).

##### F/NF

Whether the material is friable (can be reduced to powder by hand pressure) or non-friable.

##### Condition

Assessment on whether the material is in good condition, fair condition, or poor condition.

##### Estimated Quantity

Approximate quantity of confirmed ACM, broken down by location.

##### Abbreviations

SF = Square Feet

LF = Linear Feet

EA = Each



### 3.7.2 Report Format for RCRA Metals Testing Data Results

Test Number

Sequential representative sample number as recorded by the XRF device.

Ag/As/Ba/Cd/Cr/Hg/Pb/Se

Abbreviation of the RCRA 8 Metals Tested.

Ag = Silver  
As = Arsenic  
Ba = Barium  
Cd = Cadmium  
Cr = Chromium  
Hg = Mercury  
Pb = Lead  
Se = Selenium

Room Number

Location in facility where test was taken.

Wall

Area in the Room where test was taken.

N = North  
S = South  
W = West  
E = East

Component

What was surveyed in the room (i.e., wall, column, etc.).

Substrate

What the component consists of (i.e., concrete, brick, etc.).

Paint Color

Color of paint on the tested component.



## 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.

PSI performed an asbestos survey of the Mizzou North Building between February 15, 2022 and February 25, 2022. The following table includes the results of the February of 2022 survey.

Sample Numbers	Description	General Location	Asbestos, % and type	F/NF	Condition	Estimated Quantity
MN-RS-A- 1, 2, 3, 4, 5	Roofing System (Rubber Membrane, Gypsum Board, IsoBoard, 4" to 6" thick)	Throughout	ND, ND, ND, ND, ND	NF	Good	NA
MN-RF-B- 1, 2, 3, 4, 5	Roof Flashing (Black Mastic)	Throughout	ND, ND, ND, ND, ND	NF	Good	NA
MN-DW-C- 1,2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	Wall System - (1) Drywall and (2) Joint Compound	Throughout	(1) ND, ND, ND, ND, ND, ND, ND, ND, ND, ND, ND, ND (2) ND, ND, ND, ND, ND, ND, ND, ND, ND, ND, ND, ND	F	Good	NA
MN-PW-D- 1, 2, 3, 4, 5, 6, 7, 8, 9, 10	Plaster Walls and Ceiling	Throughout	ND, ND, ND, ND, ND, ND, ND, ND, ND, ND, ND, ND	NF	Good	NA
<b>MN-FT-E- 1, 2, 3, 4</b>	<b>Floor Tile – (1) 12" White w/ Black Specks, and (2) Black Mastic</b>	<b>2018, C3000, C3001, C3002, C3003, C3004, C3005, 3007, 3007A, 3007B, 3008, 3008A, 3009, 3014, 3016, 3018, 3021, 3022, 3023, 3026, 3028A, 3028B, 3034, 3035A, 3036, 3038, 3040, 3041, 3043A</b>	<b>(1) ND, ND, ND, 3% CH (2) ND, ND, ND, 5% CH</b>	<b>NF</b>	<b>Good</b>	<b>8,600 SF</b>
<b>MN-FT-F- 1, 2, 3, 4, 5</b>	<b>Floor Tile – (1) 9" White w/ Grey and Black Streaks, and (2) Black Mastic</b>	<b>224, 225, 226, C300, C301, C302, 304, 325, 326, C401, C402, 402, 402B, 408, 408A, 408A1, 408A2, 408B, 408C, 408D, 408E, 410, 411, 412, 414, 415, 416, 417, 419D, 421, 421A, 421C, 421E, 421F, 421H, 424, 424A, 424B, 505</b>	<b>(1) 3% CH, 3% CH, 3% CH, 2% CH, 2% CH, 2% CH (2) ND, ND, ND, ND, ND, ND</b>	<b>NF</b>	<b>Good</b>	<b>8,300 SF</b>
<b>MN-FT-G- 1, 2, 3</b>	<b>Floor Tile – (1) 9" Grey w/ White Streaks, and (2) Black Mastic</b>	<b>C401, C402, 402, 402B, 405, 408, 408A, 408A1, 408A2, 408B, 408C, 408D, 408E, 410, 411, 412, 414, 415, 419D, 421, 421A, 421C, 421E, 421F, 421H</b>	<b>(1) 3% CH, 3% CH, 3% CH (2) ND, ND, ND</b>	<b>NF</b>	<b>Good</b>	<b>4,300 SF</b>
<b>MN-FT-H- 1, 2, 3</b>	<b>Floor Tile – (1) 9" Black w/ White Streaks, and (2) Black Mastic</b>	<b>54, 55, 56, C401, C402, 402, 402B, 408, 408A, 408A1, 408A2, 408B, 408C, 408D, 408E, 410, 411, 412, 414, 415, 417, 419D, 421, 421A, 421C, 421E, 421F, 421H</b>	<b>(1) 3% CH, ND, ND (2) ND, ND, ND</b>	<b>NF</b>	<b>Good</b>	<b>5,500 SF</b>
MN-FT-I- 1, 2, 3, 4, 5	Floor Tile – (1) 16" Olive Green w/ White Streaks, and (2) Yellow Mastic	206, 209A, 223, 305, 309, 320, 406, 516	(1) ND, ND, ND, ND, ND (2) ND, ND, ND, ND, ND	NF	Good	NA



Sample Numbers	Description	General Location	Asbestos, % and type	F/NF	Condition	Estimated Quantity
<b>MN-FT-J- 1, 2, 3, 4, 5, 6</b>	<b>Floor Tile – (1) 12" Grey w/ White and Dark Grey Mottles, and (2) Yellow Mastic</b>	<b>C001, 27I, 68B, 70A, 416B, 421B, 521, 705</b>	<b>(1) ND, ND, ND, ND, 2% CH, 2% CH</b> (2) ND, ND, ND, ND, ND, ND	<b>NF</b>	<b>Good</b>	<b>2,000 SF</b>
MN-FT-K- 1, 2, 3	Floor Tile – (1) 12" Grey w/ Dark Grey Streaks w/ (2) Yellow Mastic	421D, C2003, 2021, 2021D, 2022, 2023	(1) ND, ND, ND (2) ND, ND, ND	NF	Good	NA
MN-CT-L- 1, 2, 3, 4, 5	Ceiling Tile - 2x2 Textured w/ Small Dots	<i>Various offices and corridors throughout the ground level, 1st floor, 2nd floor, 4th floor, 5th floor, 6th floor, and 7th floor</i>	ND, ND, ND, ND, ND	F	Good	NA
MN-CT-M- 1, 2, 3	Ceiling Tile - 2x4 Peck & Pin	C001, 8, 8A, 8B, 8C, 34A, 408, 408A, 408A1, 408A2, 408B, 408C, 408D	ND, ND, ND	F	Good	NA
MN-CT-N- 1, 2, 3, 4	Ceiling Tile - Pin & Burrow (Faux 2x2)	C040, C007A, 35, 39C, 39C1, 39H, 39J, 39K, 39M1, 39N, 39P, 39Q, 42B, 50, 50C, 50D, 2005, 2011, 2011A, 2011B, 2011C, 2011D, 2014, 2014A, 2014B, 2014C, 2014D, 2014E, 2014F, 2014G, 2014H, 2014I, 2018B, 2018C, 2042, 3041, C402, 416, 421h, 424, 424A, 424B, 604, 605, 609	ND, ND, ND, ND	F	Good	NA
MN-CT-O- 1, 2, 3, 4	Ceiling Tile - 2x2 Gypsum Board	1, 1A, 1F, 109A, 1031, 1032, 1033, 1034, 2002B, 2002C, 3020, 3024, 3027, 416B, 618, 619	ND, ND, ND, ND	F	Good	NA
<b>MN-PI-P- 1, 2, 3, 4, 5, 6</b>	<b>TSI Pipe Insulation and/or Joints</b>	<b>Throughout pipe chases in all rooms and throughout the boiler room</b>	<b>50% CH, 50% CH, 50% CH, 50% CH, 50% CH, 50% CH</b>	<b>F</b>	<b>Fair</b>	<b>10,000 LF</b>
MN-CB-Q- 1, 2, 3, 4, 5, 6	Cove Base - (1) 4in/6in, Multi-Colored, and (2) Yellow Mastic	Throughout	(1) ND, ND, ND, ND, ND, ND (2) ND, ND, ND, ND, ND, ND	NF	Good	NA
MN-WC-R- 1, 2, 3, 4	Window Caulking - Grey	Various offices and corridors throughout the 1st floor, 3rd floor, and 4th floor	ND, ND, ND, ND	NF	Good	NA
MN-SM-S- 1, 2, 3, 4	Sink Undercoating - White	34A, 39P, 64, 147, 1039, 1042, 1043, 2002B, 2002C, 421, 607, 608, 705	ND, ND, ND, ND	NF	Good	NA
MN-DC-T- 1, 2, 3, 4, 5	Duct Caulking - Green	Throughout	ND, ND, ND, ND, ND	NF	Good	NA
MN-CT-U- 1, 2, 3	Ceiling Tile - 2x2 Peck & Pin	Various offices and corridors throughout the Ground floor, 1st floor, 2nd floor, 3rd floor, 6th floor, and 7th floor	ND, ND, ND	F	Good	NA
MN-DW-V- 1, 2, 3	Wall System - (1) Drywall and (2) Joint Compound - Textured	208, 209, 210, 211, 212, 214, 217, 218, 219, 220, 221, 222, 225	(1) ND, ND, ND (2) ND, ND, ND	F	Good	NA
<b>MN-SM-W- 1, 2, 3</b>	<b>Sink Undercoating - Black</b>	<b>33, 34F, 301, 3011, 3015, 3017, 3018, 3024, 3027, 3032, 3035, 3042, 3043C, 3045, 3046, 600</b>	<b>2% CH, 2% CH, 2% CH</b>	<b>F</b>	<b>Good</b>	<b>16 Ea.</b>
<b>MN-FT-X- 1, 2, 3, 4, 5, 6</b>	<b>Floor Tile – (1) 12" Tan w/ White Mottles, and (2) Black Mastic</b>	<b>8, 8A, 8B, 8C, 62, 107B, 208, 209, 210, 211, 212, 214, 215, 217, 218, 219, 220, 221, 222, 2018, 2018B, 2018C, 2042, 302, 307, 307A, 308, 308A, 310, 311, 311A, 312, 312A, 314, 314A, 315, 317, 317A, 318, 318A, 319, 319A, 321, 321A, 322, 322A</b>	<b>(1) ND, ND, ND, ND, ND, ND</b> <b>(2) 3% CH, 3% CH, 3% CH, ND, ND, ND</b>	<b>NF</b>	<b>Good</b>	<b>9,800 SF</b>
<b>MN-FT-Y- 1, 2, 3</b>	<b>Floor Tile – (1) 12" Red w/ Red Mottles, and (2) Black Mastic</b>	<b>208, 208B1, 209, 209B, 210, 211, 212, 214, 215, 217, 218, 219, 221, 222, 2018</b>	<b>(1) ND, ND, ND</b> <b>(2) 3% CH, 3% CH, 3% CH</b>	<b>NF</b>	<b>Good</b>	<b>4,700 SF</b>



Sample Numbers	Description	General Location	Asbestos, % and type	F/NF	Condition	Estimated Quantity
MN-FT-Z- 1, 2, 3, 4	Floor Tile – (1) 12” White w/ Dark Tan & Light Blue, and (2) Yellow & Black Mastic	1002D, 1016, 1038, 1039, 1042, 1043, 1046, 1046A, 1046B, 1046C, 1046D, 1046E, 1046F, C2000, C2003, 2005, 2014, 2014A, 2014B, 2014C, 2014D, 2014E, 2014F, 2014G, 2014H, 2014I, 2018, 2018A, 2020, 2024, 2055, 2056, 504	(1) ND, ND, 3% CH, ND (2) ND, ND, 5% CH, ND	NF	Good	11,700 SF
MN-FT-AA- 1, 2, 3, 4	Floor Tile – (1) 12” Black w/ White Streaks, and (2) Black Mastic	215, 2018, 3010, 3011, 3012, 3012A, 3015, 3017, 3019, 3020, 3027, 3029, 3030, 3031, 3032, 3033, 3035, 3037, 3043B, 3044, 3045, 3046, 3048, 3050	(1) ND, ND, ND, ND (2) 3% CH, 3% CH, 3% CH, 3% CH	NF	Good	7,100 SF
MN-WC-AC- 1, 2, 3	Window Caulking - White	Various offices and corridors throughout the 1st floor, 2nd floor, 6th floor, and 7th floor	ND, ND, ND	NF	Good	NA
MN-FT-AD- 1, 2, 3	Floor Tile – (1) 12” Tan w/ Light Blue Streaks, and (2) Yellow Mastic	C2000	(1) ND, ND, ND (2) ND, 2% CH, 2% CH	NF	Good	1,600 SF
MN-FT-AE- 1, 2, 3	Floor Tile – (1) 12” Black, and (2) Yellow Mastic	C2000, C3000, 302, 307, 308, 310, 311, 312, 314, 315, 317, 318, 319, 321, 322	(1) ND, ND, ND (2) 3% CH, ND, 2% CH	NF	Good	5,600 SF
MN-FT-AF- 1, 2, 3	Floor Tile – (1) 12” Teal w/ White Streaks, and (2) Black Mastic	2002, 2002A, 2006A, 2006B, 2007, 2021A, 2021B, 2021C, 2022B	(1) 3% CH, 3% CH, 3% CH (2) 5% CH, 5% CH, 5% CH	NF	Good	1,200 SF
MN-FT-AG- 1, 2, 3	Floor Tile – (1) 12” Grey w/ Black Specks, and (2) Yellow Mastic	2002, 2002B, 2002D, 2002E, 2003, 2004, 2022A, 2023A	(1) ND, ND, ND (2) ND, ND, ND	NF	Good	NA
MN-LS-AH- 1, 2, 3	Floor Sheeting - Grey	64, 69, 1038A, 1040, 2003A	ND, ND, ND	F	Good	NA
MN- FP-AI- 1, 2, 3	Spray-Applied Fire Proofing - Grey	Entire Eastern Portion of the Ground floor, 1st floor, 2nd floor, and 3rd floor	ND, ND, ND	F	Good	NA
MN-FT-AJ- 1, 2, 3	Floor Tile – (1) 12” White w/ Dark Tan Streaks, and (2) Black Mastic	39J, 45A, 607, 608	(1) 3% CH, 3% CH, 3% CH, 3% CH (2) 5% CH, 5% CH, 5% CH, 5% CH	NF	Good	7,500 SF
MN-FT-AK- 1, 2, 3, 4, 5, 6	Floor Tile – (1) 12” Cream w/ Brown Speckles, and (2) Black Mastic	C003, C006, C007, C033, 14A, 15, 23, 26B, 32, 32A, 32A1, 32B, 32C, 32D, 32E, 32F, 34A, 35A, 36, 36A, 39K, 39N, 39P, 39Q, 41, 41A, 42B, 43, 44, 52, C105, C106, C1000, C1001, C1002, C1003, C1004, C1078, 120, 122, 122A, 1002, 1002A, 1002C, 1002E, 1004, 1006B, 1006C, 1006D, 1022, 1023, 1024, 1045, 1045A, 1057, 1072, 1072A, 1072B, 1072C, 1076, C600, C601, C602, 600, 601, 602A, 609, 613, C700, C700A, C700B, C706, 701, 704, 704A, 704B, 704C, 704D, 705, 705A, 706, 706C1, 706E, 707A, 707B	(1) 3% CH, 3% CH, 3% CH, 3% CH, 3% CH (2) 5% CH, 5% CH, 5% CH, 5% CH, 5% CH	NF	Good	26,000 SF
MN-FT-AL- 1, 2, 3, 4	Floor Tile – (1) 12” Cream w/ Brown Streaks, and (2) Yellow Mastic	2018, 515, 704A	(1) ND, ND, ND, ND (2) ND, ND, ND, ND	NF	Good	NA
MN-FT-AM- 1, 2, 3, 4, 5, 6	Floor Tile – (1) 12” Light Blue w/ Blue and Green Streaks, and (2) Yellow or Black Mastic	C1005, C1005A, 125, 126, 127, 128, 129, 132, 141, 143, 145, 148, 1048, 1049, 1050, 1051, 1052, 1054, 1054A, 1054B, 1054C, 1054D, 1061, 1062, 1064, 1065, 1066, 1067, 1068,	(1) ND, ND, ND, ND, ND, ND (2) ND, ND, ND, ND, ND, 2% CH	NF	Good	7,100 SF



Sample Numbers	Description	General Location	Asbestos, % and type	F/NF	Condition	Estimated Quantity
		<b>1069, 1070, 1071, 2038, 327, 705, Elevators</b>				
MN-FT-AN-1, 2, 3, 4	Floor Tile – (1) 12” Light Brown w/ Black, White, and Brown Streaks, and (2) Yellow Mastic	124, 1006A, 1006E, 1006F, 1007, C706, 702, 703, 706B, 706C, 706D, 707C	(1) ND, ND, ND, ND (2) ND, ND, ND, ND	NF	Good	NA
MN-SM-AO-1, 2, 3, 4	Sink Mastic - Grey	50D, 68A, 1002C, 1025, 1028A, 1031, 1034, 1037, 2021D, 3020, 3023, 618, 619, 706C1	ND, ND, ND, ND	F	Good	NA
MN-CT-AP-1, 2, 3	Ceiling Tile - Textured w/ Leaf/Star Design	610, 611, 612, 614, 615, 616, 617	ND, ND, ND	F	Good	NA
MN-FT-AQ-1, 2, 3	Floor Tile – (1) 12” Tan w/ White and Dark Tan Mottles, and (2) Yellow Mastic	54, 55, 56, 2018, 603, 603A, 604, 604A, 605, 605A, 606, 610, 611, 612, 614, 614B, 615, 616, 617	(1) ND, ND, ND (2) ND, ND, ND	NF	Good	NA
MN-FT-AR-1, 2, 3, 4	Floor Tile – (1) 12” Tan w/ White and Dark Tan Mottles, and (2) Yellow Mastic	118, 603, 604, 605, 606, 610, 611, 612, 614, 615, 616, 617	(1) ND, ND, ND, ND (2) ND, ND, ND, ND	NF	Good	NA
<b>MN-FT-AS-1, 2, 3</b>	<b>Floor Tile – (1) 12” Light Blue w/ Mottles, and (2) Black Mastic</b>	<b>C001, 1, 8C, 10, 11, 12, 54, 55, 56, 608</b>	(1) ND, ND, ND (2) 2% CH, 5% CH, 3% CH	<b>NF</b>	<b>Good</b>	<b>3,000 SF</b>
<b>MN-MP-AT-1, 2, 3, 4</b>	<b>Ceiling Tile Adhesive - Dark Brown</b>	<b>Western portion of the 1st floor, C200, C200A, C201, C202, C600, C601, C602, 603, 608</b>	<b>ND, ND, ND, 2% CH</b>	<b>NF</b>	<b>Good</b>	<b>10,000 SF</b>
<b>MN-FT-AU-1, 2, 3, 4, 5</b>	<b>Floor Tile – (1) 12” Dark Blue w/ Mottles, and (2) Yellow or Black Mastic</b>	<b>125, 126, 127, 128, 129, 132, 134, 135, 136, 137, 138, 139, 140A, 140B, 141, 142, 142A, 143, 145, 148, 1048, 1049, 1050, 1051, 1052, 1054, 1054A, 1054B, 1054C, 1054D, 1061, 1062, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 521, Elevators</b>	(1) ND, ND, ND, ND, ND (2) 5% CH, 5% CH, 5% CH, ND, 5% CH	<b>NF</b>	<b>Good</b>	<b>7,200 SF</b>
MN-AT-AV-1, 2, 3	Floor Tile – (1) 12” Brown w/ Orange Streaks, and (2) Yellow Mastic	523	(1) ND, ND, ND (2) ND, ND, ND	NF	Good	NA
MN-FT-AW-1, 2, 3	Floor Tile – (1) 12” Dark Brown w/ Orange Streaks, and (2) Yellow Mastic	523	(1) ND, ND, ND (2) ND, ND, ND	NF	Good	NA
<b>MN-FT-AX-1, 2, 3</b>	<b>Floor Tile – (1) 9” Brown w/ Mottles, and (2) Black Mastic</b>	<b>501, 501A, 507, 508, 509, 510, 511, 512, 514, 517, 518, 518A, 519, 522, 524, 525, C800, 804, S800C</b>	(1) 2% CH, 2% CH, 2% CH, 2% CH (2) 5% CH, 5% CH, 5% CH, 5% CH	<b>NF</b>	<b>Good</b>	<b>4,300 SF</b>
MN-FT-AY-1, 2, 3, 4	Floor Tile – (1) 9” White w/ Green Streaks, and (2) Black Mastic	30, 205, 304A, 323, 4th floor stairwell	(1) ND, ND, ND, ND (2) ND, ND, ND, ND	NF	Good	NA
MN-FT-AZ-1, 2, 3	Floor Tile – (1) 12” White & Blue Conglomerate, and (2) Black Mastic	C2005, 2037, 2040, 2041	(1) ND, ND, ND (2) ND, ND, ND	NF	Good	NA
<b>MN-FT-BA-1, 2, 3</b>	<b>Floor Tile – (1) 12” Light Blue w/ Black Speckles, and (2) Yellow or Black Mastic</b>	<b>2008, 2018, 2020</b>	(1) ND, ND, ND (2) ND, 3% CH, 3% CH	<b>NF</b>	<b>Good</b>	<b>1,700 SF</b>
MN-FT-BB-1, 2, 3, 4	Floor Tile – (1) 12” Green w/ Dark Green and White Streaks, and (2) Black Mastic	2018, 302, 307, 307A, 308, 308A, 310, 310A, 311, 311A, 312, 312A, 314, 314A, 315, 317, 317A, 318, 318A, 319, 319A, 321, 321A, 322, 322A, 3023	(1) ND, ND, ND, ND (2) ND, ND, ND, ND	NF	Good	NA
MN-CT-BC-1, 2, 3	Ceiling Tile - 2x2 Textured Peck & Pin	2024	ND, ND, ND	F	Good	NA



Sample Numbers	Description	General Location	Asbestos, % and type	F/NF	Condition	Estimated Quantity
<b>MN-FH-BD</b>	<b>Fume Hoods</b>	<b>3011, 3015, 3017, 3027, 3030</b>	<b>Assumed</b>	<b>NF</b>	<b>Good</b>	<b>6 Ea.</b>
<b>MN-TC-BE</b>	<b>Countertops</b>	<b>3011, 3012, 3015, 3017, 3020, 3024, 3027, 3030, 3033, 3035, 3037, 3042, 3043B, 3043C, 3045, 3046</b>	<b>Assumed</b>	<b>NF</b>	<b>Good</b>	<b>16 Ea.</b>
MN-VC-BF-1, 2, 3	Vibration Cloth - Olive Green	3048A	ND, ND, ND	NF	Fair	NA
MN-DI-BG-1, 2, 3	Duct Insulation - Wood Particle Board w/ White Coating	M500	ND, ND, ND	F	Fair	NA
MN-FT-BH-1, 2, 3	Floor Tile – (1) 12” Pink w/ Black Speckles, and (2) Yellow Mastic	42, C102, 1025, 1026, 1027, 1028, 1028A, 1029	(1) ND, ND, ND (2) ND, ND, ND	NF	Good	NA
MN-LS-BI- 1, 2, 3	Floor Sheeting - (1) Cream & Pink Conglomerate, and (2) Yellow Mastic	105, 105A, 105B, 106, 107, 108, 108A, 109, 109A, 110, 111, 111A, 111B, 112, 112A	(1) ND, ND, ND (2) ND, ND, ND	F	Good	NA
MN-CT-BJ- 1, 2, 3	Ceiling Tiles - (1) 1x1 w/ Dots, and (2) Dark Brown Mastic Pucks	15, 118	(1) ND, ND, ND (2) ND, ND, ND	F	Good	NA
MN-FT-BK-1, 2, 3	Floor Tile – (1) 12” Dark Grey w/ Mottles, and (2) Yellow Mastic	C1078	(1) ND, ND, ND (2) ND, ND, ND	NF	Good	NA
<b>MN-FT-BL-1, 2, 3</b>	<b>Floor Tile – (1) 12” Light Blue w/ Dark Blue Streaks, and (2) Yellow Mastic</b>	<b>125, 126, 127, 128, 129, 132, 141, 143, 145, 148, 1048, 1049, 1050, 1051, 1052, 1054, 1054A, 1054B, 1054C, 1054D, 1061, 1062, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071</b>	<b>(1) ND, ND, ND (2) ND, ND, 5% CH</b>	<b>NF</b>	<b>Good</b>	<b>5,400 SF</b>
MN-CT-BM-1, 2, 3	Ceiling Tiles - 2x4 Textured	1046	ND, ND, ND	F	Good	NA
<b>MN-LS-BN-1, 2, 3*</b>	<b>Floor Sheeting - (1) White w/ Blue &amp; Pink Speckles, and (2) Yellow Mastic</b>	<b>53G, 71A, 71B, 1031, 1032, 1033, 1034, 1035, 1036, 1037</b>	<b>(1) ND, ND, ND (2) ND, ND, &lt;1% CH</b>	<b>NF</b>	<b>Good</b>	<b>1,300 SF</b>
MN-FT-BO-1, 2, 3	Floor Tile – (1) 12” White w/ Brown Streaks, and (2) Yellow Mastic	C106, 134, 135, 136, 137, 138, 139, 140A, 140B, 142, 142A	(1) ND, ND, ND (2) ND, ND, ND	NF	Good	NA
MN-WG-BP-1, 2, 3	Window Glazing	24B	ND, ND, ND	NF	Fair	NA
MN-LS-BQ-1, 2, 3	Floor Sheeting - Green, Blue, Black, & Tan Dots	41, 41A, 41B, 41C, 41C1, 41D, 50, 50B, 50D	ND, ND, ND	F	Good	NA
MN-CS-BR-1, 2, 3	Popcorn Ceiling Material - White	Tunnel to 68A	ND, ND, ND	F	Good	NA
MN-LS-BS- 1, 2, 3	Floor Sheeting - (1) Faux Wood, and (2) Yellow Mastic	Tunnel to 68A, 68A	(1) ND, ND, ND (2) ND, ND, ND	NF	Good	NA
<b>MN-FD-BT</b>	<b>Fire Doors</b>	<b>Throughout</b>	<b>Assumed</b>	<b>NF</b>	<b>Good</b>	<b>200 Ea.</b>
<b>MN-EW-BU</b>	<b>Electrical Wiring</b>	<b>Throughout Stairwells</b>	<b>Assumed</b>	<b>NF</b>	<b>Good</b>	<b>500 LF</b>

Materials found to be asbestos-containing are **bolded** and *italicized*.  
 ND = No Asbestos Detected    NA = Not Applicable    NT = Not Analyzed Due To 1<sup>st</sup> Positive  
 CH = Chrysotile asbestos    AM = Amosite asbestos  
 SF = Square Feet    LF = Linear Feet    EA = Each  
 F – Friable    NF = Non-Friable    \*Material was analyzed by Point Count Method

Based on the February of 2022 survey, the following materials were found to contain asbestos:

- 12” by 12” White Floor Tile with Black Specks and Black Mastic – located in Rooms 2018, C3000, C3001, C3002, C3003, C3004, C3005, 3007, 3007A, 3007B, 3008, 3008A, 3009, 3014, 3016, 3018, 3021, 3022, 3023, 3026, 3028A, 3028B, 3034, 3035A, 3036, 3038, 3040, 3041, 3043A - approximately 8,600 square feet





- 9" by 9" White Floor Tile with Grey and Black Streaks – located in Rooms 224, 225, 226, C300, C301, C302, 304, 315, 325, 326, C401, C402, 402, 402B, 408, 408A, 408A1, 408A2, 408B, 408C, 408D, 408E, 410, 411, 412, 414, 415, 416, 417, 419D, 421, 421A, 421C, 421E, 421F, 421H, 424, 424A, 424B, 505 - approximately 8,300 square feet
- 9" by 9" Grey Floor Tile with White Streaks – located in Rooms C401, C402, 402, 402B, 405, 408, 408A, 408A1, 408A2, 408B, 408C, 408D, 408E, 410, 411, 412, 414, 415, 419D, 421, 421A, 421C, 421E, 421F, 421H - approximately 4,300 square feet
- 9" by 9" Black Floor Tile with White Streaks – located in Rooms 54, 55, 56, C401, C402, 402, 402B, 408, 408A, 408A1, 408A2, 408B, 408C, 408D, 408E, 410, 411, 412, 414, 415, 417, 419D, 421, 421A, 421C, 421E, 421F, 421H, 3037 - approximately 5,500 square feet
- 12" by 12" Grey Floor Tile with White and Dark Grey Mottles – located in Rooms C001, 271, 68B, 70A, 416B, 421B, 521, 705 - approximately 2,000 square feet
- Pipe and Pipe Fitting Insulation – located throughout the boiler room and pipe chases within all rooms - approximately 10,000 linear feet
- Black Sink Undercoating – located in Rooms 33, 34F, 301, 3011, 3015, 3017, 3018, 3024, 3027, 3032, 3035, 3042, 3043C, 3045, 3046, 600 – approximately 16 each
- Black Floor Mastic – located in Rooms 8, 8A, 8B, 8C, 62, 107B, 208, 209, 210, 211, 212, 214, 215, 217, 218, 219, 220, 221, 222, 2018, 2018B, 2018C, 2042, 302, 307, 307A, 308, 308A, 310, 311, 311A, 312, 312A, 314, 314A, 315, 317, 317A, 318, 318A, 319, 319A, 321, 321A, 322, 322A - approximately 9,800 square feet
- Black Floor Mastic – located in Rooms 208, 208B1, 209, 209B, 210, 211, 212, 214, 215, 217, 218, 219, 221, 222, 2018 - approximately 4,700 square feet
- 12" by 12" White Floor Tile with Dark Tan and Light Blue Streaks and Yellow and/or Black Mastic – located in Rooms 1002D, 1016, 1038, 1039, 1042, 1043, 1046, 1046A, 1046B, 1046C, 1046D, 1046E, 1046F, C2000, C2003, 2005, 2014, 2014A, 2014B, 2014C, 2014D, 2014E, 2014F, 2014G, 2014H, 2014I, 2018, 2018A, 2020, 2024, 2055, 2056, 504 - approximately 11,700 square feet
- Black Floor Mastic – located in Rooms 215, 2018, 3010, 3011, 3012, 3012A, 3015, 3017, 3019, 3020, 3027, 3029, 3030, 3031, 3032, 3033, 3035, 3037, 3043B, 3044, 3045, 3046, 3048, 3050 - approximately 7,100 square feet
- Yellow Floor Mastic – located in Rooms C2000 - approximately 1,600 square feet
- Yellow Floor Mastic – located in Rooms C2000, C3000, 302, 307, 308, 310, 311, 312, 314, 315, 317, 318, 319, 321, 322 - approximately 5,600 square feet
- 12" by 12" Teal Floor Tile with White Streaks and Black Mastic – located in Rooms 2002, 2002A, 2006A, 2006B, 2007, 2021A, 2021B, 2021C, 2022B - approximately 1,200 square feet
- 12" by 12" White Floor Tile with Dark Tan Streaks and Black Mastic – located in Rooms 39J, 45A, 607, 608 - approximately 7,500 square feet
- 12" by 12" Cream Floor Tile with Brown Speckles and Black Mastic – located in Rooms C003, C006, C007, C033, 14A, 15, 23, 26B, 32, 32A, 32A1, 32B, 32C, 32D, 32E, 32F, 34A, 35A, 36, 36A, 39K, 39N, 39P, 39Q, 41, 41A, 42B, 43, 44, 52, C105, C106, C1000, C1001, C1002, C1003, C1004, C1078, 120, 122, 122A, 1002, 1002A, 1002C, 1002E, 1004, 1006B, 1006C, 1006D, 1022, 1023, 1024, 1045, 1045A, 1057, 1072, 1072A, 1072B, 1072C, 1076, C600, C601, C602, 600, 601, 602A, 609, 613, C700, C700A, C700B, C706, 701, 704, 704A, 704B, 704C, 704D, 705, 705A, 706, 706C1, 706E, 707A, 707B - approximately 26,000 square feet
- Black Floor Mastic – located in Rooms C1005, C1005A, 125, 126, 127, 128, 129, 132, 141, 143, 145, 148, 1048, 1049, 1050, 1051, 1052, 1054, 1054A, 1054B, 1054C, 1054D, 1061, 1062, 1064,



- 1065, 1066, 1067, 1068, 1069, 1070, 1071, 2038, 327, 705, Elevators - approximately 7,100 square feet
- Black Floor Mastic – located in Rooms C001, 1, 8C, 10, 11, 12, 54, 55, 56, 608 - approximately 3,000 square feet
- Dark Brown Ceiling Tile Adhesive – located in Rooms Western portion of the 1st floor, C200, C200A, C201, C202, C600, C601, C602, 603, 608 – approximately 10,000 square feet
- Black Floor Mastic – located in Rooms 125, 126, 127, 128, 129, 132, 134, 135, 136, 137, 138, 139, 140A, 140B, 141, 142, 142A, 143, 145, 148, 1048, 1049, 1050, 1051, 1052, 1054, 1054A, 1054B, 1054C, 1054D, 1061, 1062, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 521, Elevators - approximately 7,200 square feet
- 9” by 9” Brown Floor Tile with Mottles and Black Mastic – located in Rooms 501, 501A, 507, 508, 509, 510, 511, 512, 514, 517, 518, 518A, 519, 522, 524, 525, C800, 804, S800C - approximately 4,300 square feet
- Black Floor Mastic – located in Rooms 2008, 2018, 2020 - approximately 1,700 square feet
- Fume Hoods – located in Rooms 3011, 3015, 3017, 3027, 3030 - 6 each
- Countertops – located in Rooms 3011, 3012, 3015, 3017, 3020, 3024, 3027, 3030, 3033, 3035, 3037, 3042, 3043B, 3043C, 3045, 3046 - 16 each
- Yellow Floor Mastic – located in Rooms 125, 126, 127, 128, 129, 132, 141, 143, 145, 148, 1048, 1049, 1050, 1051, 1052, 1054, 1054A, 1054B, 1054C, 1054D, 1061, 1062, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071 - approximately 5,400 square feet
- Yellow Floor Mastic – located in Rooms 53G, 71A, 71B, 1031, 1032, 1033, 1034, 1035, 1036, 1037 - approximately 1,300 square feet
- Fire Doors – located throughout the Mizzou North Building – approximately 200 each
- Electrical Wiring – located throughout stairwells – approximately 500 linear feet (estimated)

The aforementioned materials should be removed by a State of Missouri licensed asbestos abatement contractor prior to demolition.

Please Note: The yellow floor mastic located in Rooms 53G, 71A, 71B, 1031, 1032, 1033, 1034, 1035, 1036, 1037 was found to contain <1% Chrysotile asbestos. PSI contacted the lab to utilize the remaining sample to analyze the material via the Point Count Method. The analysis was performed at PSI’s NVLAP accredited laboratory in Pittsburgh, Pennsylvania for analysis by polarized light microscopy (PLM), quantitation using 400 Point Count Procedure. The laboratory report and chain-of-custody form is attached to this letter report. The bulk sample results are as follows:

Sample Numbers	Description	General Location	Asbestos, % and type	F/NF	Condition	Estimated Quantity
MN-LS-BN-03	Yellow Mastic	53G, 71A, 71B, 1031, 1032, 1033, 1034, 1035, 1036, 1037	<1% CH	NF	Good	1,300 SF

Materials found to be asbestos-containing are **bolded** and *italicized*.  
 ND = No Asbestos Detected    NA = Not Applicable    NT = Not Analyzed Due To 1<sup>st</sup> Positive  
 CH = Chrysotile asbestos    AM = Amosite asbestos  
 SF = Square Feet    LF = Linear Feet    EA = Each  
 F – Friable    NF = Non-Friable



Based on the sample results, the yellow mastic located in Rooms 53G, 71A, 71B, 1031, 1032, 1033, 1034, 1035, 1036, 1037 was found to contain less than 1% asbestos.

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 D. Appendix C contains the floor plans with the approximate location of the confirmed asbestos-containing materials.

#### 4.2 ASBESTOS SURVEY SUMMARY – WHOLE BUILDING

- 12" x 12" Floor Tiles and/or Mastic = approximately 110,200 square feet
- 9" x 9" Floor Tiles and/or Mastic = approximately 22,400 square feet
- Floor Sheeting and/or Mastic = approximately 1,300 square feet
- Pipe and Pipe Fitting Insulation = approximately 10,000 linear feet
- Sink Undercoating = approximately 16 each
- Ceiling Tile Adhesive = approximately 10,000 square feet
- Fume Hoods = approximately 6 each
- Tabletops = approximately 16 each
- Fire Doors = approximately 950 each
- Wire Insulation = approximately 500 linear feet

#### 4.3 RCRA METALS FIELD TESTING SUMMARY

##### RCRA Metals in Paint

Some of the painted items tested by the XL2 XRF contained the metals of concern at or above the concentrations specified in the Missouri Department of Natural Resources (MDNR) Solid Waste Management Program document titled "Using Painted Block and Brick as Clean Fill", updated January 31, 2003. The concentrations specified in that document include:

- Silver (Ag): 99 parts per million (ppm);
- Arsenic (As): 87 ppm;
- Barium (Ba): 15,200 ppm;
- Cadmium (Cd): 429 ppm;
- Chromium (Cr): 3,285 ppm;
- Lead (Pb): 4,999 ppm
- Mercury (Hg): 100 ppm; and
- Selenium (Se): 50 ppm.

Although this document has been rescinded, for the purposes of trying to determine whether painted concrete, brick, and cinder blocks may be able to be used as clean fill, the levels listed in this document will be referenced, per recent correspondence between MNDR and PSI. At this time, this appears to be the best method of trying to determine whether these items may be used as clean fill prior to building demolition, as the TCLP method required to determine this is not feasible until building demolition.



The following items were found to contain elevated RCRA metals compared to the above listed concentrations.

- Room 23A, Ground Floor – Concrete columns - yellow | Ag
- Room 24B, Ground Floor – Concrete columns – gold and beige | Ag
- Room 28, Ground Floor – brick walls - white | Ag and As
- Room 32D, Ground Floor – Concrete walls - light blue | Ag
- Room 32E, Ground Floor – Concrete walls - white | Ag
- Room 34G, Ground Floor – Concrete walls - white | Ag
- Room 39J, Ground Floor – Concrete walls and columns - tan | Ag
- Room 52, Ground Floor – Concrete walls - tan | Ag
- Room 704, 7<sup>th</sup> Floor – brick walls – light green | Ag
- Stairwell D, Mezzanine – Concrete ceiling - white | Ag

The above listed areas had RCRA metals above the MDNR Clean Fill allowable level; therefore, these materials, more than likely, cannot be used as clean fill. Other painted CMU block, brick, and concrete surfaces contained levels that may be acceptable to be used as clean fill, pending analysis of the demolition debris by TCLP. Please refer to Appendix B for a detailed description of additional areas tested.

#### **4.4 UNIVERSAL WASTES AND OTHER ENVIRONMENTAL CONCERNS SURVEY SUMMARY**

The following universal wastes and other environmental concerns were identified during the survey.

##### Fluorescent Light Tubes

Approximately 7,500 fluorescent light tubes were noted throughout the building. Fluorescent light tubes may contain small amounts of Mercury and should be disposed of properly.

##### PCB-Containing Light Ballasts

Approximately 2,100 light ballasts were noted throughout the building. 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 PCB oil.

##### Smoke Detectors

Approximately 125 smoke detectors were noted throughout the building. Smoke detectors may contain small amounts of radioactive material and should be disposed of properly.

##### Fire Alarms

Approximately 230 fire alarms were noted throughout the building. These fire alarms may contain small amounts of radioactive material and should be disposed of properly.

##### Door Closures

Approximately 10 door closures were noted throughout the building. These door closures may contain hazardous components that should be disposed of properly.



#### Thermostats

Approximately 170 thermostats were noted throughout the building. These thermostats may contain small amounts of mercury and should be disposed of properly.

#### Emergency Lights

Approximately 25 emergency lights were noted throughout the building. These emergency lights may contain small amounts of lead in the batteries and should be disposed of properly.

#### Exit Signs

Approximately 160 exit signs were noted throughout the building. These exit signs may contain small amounts of lead in the batteries and should be disposed of properly.

#### Water Coolers

Approximately 25 water coolers (drinking fountains) were noted in the building. 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.

#### Electronic Wastes

Approximately 350 units of electronic wastes (computers, televisions, microwaves, etc.) were noted throughout the building. These electronic wastes may contain heavy metals and should be disposed of properly.

#### Fire Extinguishers

Approximately 60 fire extinguishers were noted throughout the building. Fire extinguishers may contain amounts of CFCs and/or HCFCs and should be disposed of properly.

#### A/C Window Units

Approximately 5 A/C window units were noted throughout the building. These A/C window units may contain amounts of CFCs and/or HCFCs and should be disposed of properly.

#### Paints/Solvents

Approximately 250 containers of paints and/or solvents were noted throughout the building. Paints and/or solvents may contain various amounts and types of volatile chemicals and should be disposed of properly.

#### Chemicals – Medical/Science Waste

Approximately 150 containers of unused chemicals are located in Rooms 50, 201, 322, 1037 and 1042. Some of the containers are not clearly labeled and will need to be properly characterized, packaged, and disposed of.

#### Compressed Gas Cylinders

Approximately 10 compressed gas cylinders were noted throughout the building. These compressed gas cylinders may contain compressed gases and/or hazardous chemicals and should be disposed of properly.



#### Aboveground Storage Tank (AST)

Approximately one (1) 3,000-gallon, and three (3) 1,500-gallon ASTs, associate with the back-up generator, were noted throughout the building. ASTs and any associated piping may contain oils, hydrocarbons and/or other hazardous materials and should be disposed of properly.

#### Underground Storage Tank (UST) – TO BE REMOVED BY OTHERS DURING DEMOLITION

PSI understands the site previously utilized one 23,000-gallon diesel UST. According to University of Missouri maintenance personnel, the UST has been decommissioned and filled with concrete. The UST and associated piping may still contain oil and/or other hydrocarbons that are considered to be hazardous waste and should be disposed of properly.

#### Refrigerator

Approximately 5 refrigerators were noted throughout the building. Refrigerators may contain amounts of CFCs and/or HCFCs and should be disposed of properly.

#### Air Compressors

Approximately 5 air compressors were noted throughout the building. These air compressors may contain compressed gases and/or hazardous chemicals and should be disposed of properly.

#### Bio-Waste Containers

Approximately 2 bio-waste containers were noted in Room 50. These bio-waste containers should be removed from the building by hospital staff trained and certified to do so.

#### Batteries

Approximately 49 batteries were noted throughout the building. These batteries may contain small amounts of lead and should be disposed of properly.

#### MRI Units

Pieces of approximately 2 MRI units were noted in Rooms 50 and 68A of the building. MRI units are governed by the Nuclear Regulatory Commission (NRC) and the USEPA Office of Air and Radiation (OAR). These MRI units may contain unknown quantities of radioactive materials that should be removed from the building by hospital staff trained and certified to do so.

#### Linear Accelerator – TO BE REMOVED PRIOR TO ABATEMENT

Approximately 1 Linear Accelerator was noted in Room 69 of the building. Linear Accelerator units are governed by the Nuclear Regulatory Commission (NRC) and the USEPA Office of Air and Radiation (OAR). This Linear Accelerator unit may contain unknown quantities of radioactive materials that should be removed from the building by hospital staff trained and certified to do so.

#### Lead Waste Crucible

Approximately 1 lead crucible was noted in Room 50. This crucible appears to have been utilized for storing radioactive material. This lead crucible should be removed from the building by hospital staff trained and certified to do so.



#### **4.5 ADDITIONAL CONSIDERATIONS**

If other materials are discovered during demolition/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: 00295291-1  
Mizzou North - Haz Mat Survey  
115 Business Loop 70W, Columbia, MO 65203  
Part 1 of 2; Prefix: MN-

Date Received: 2/21/2022

Date Completed: 2/23/2022

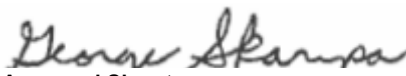
Date Reported: 2/24/2022

Analyst: Preston Hunt      Work Order: 2202533      Page: 1 of 6

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)
RS-A-01	001A	(1) Gray, Roofing, Homogeneous	NO ASBESTOS DETECTED	5% Cellulose Fiber 10% Fibrous Glass
RS-A-02	002A	(1) Gray, Roofing, Homogeneous	NO ASBESTOS DETECTED	5% Cellulose Fiber 10% Fibrous Glass
RS-A-03	003A	(1) Gray, Roofing, Homogeneous	NO ASBESTOS DETECTED	5% Cellulose Fiber 10% Fibrous Glass
RS-A-04	004A	(1) Gray, Roofing, Homogeneous	NO ASBESTOS DETECTED	5% Cellulose Fiber 10% Fibrous Glass
RS-A-05	005A	(1) Gray, Roofing, Homogeneous	NO ASBESTOS DETECTED	5% Cellulose Fiber 10% Fibrous Glass
RF-B-01	006A	(1) Black, Flashing, Homogeneous	NO ASBESTOS DETECTED	None Reported
RF-B-02	007A	(1) Black, Flashing, Homogeneous	NO ASBESTOS DETECTED	None Reported
RF-B-03	008A	(1) Black, Flashing, Homogeneous	NO ASBESTOS DETECTED	None Reported
RF-B-04	009A	(1) Black, Flashing, Homogeneous	NO ASBESTOS DETECTED	None Reported
RF-B-05	010A	(1) Black, Flashing, Homogeneous	NO ASBESTOS DETECTED	None Reported

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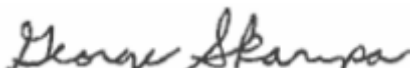
Respectfully submitted,  
PSI, Inc.

  
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)
DW-C-01	011A	(1) White, Drywall, Homogeneous (2) White, Joint Compound, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	10% Cellulose Fiber None Reported
DW-C-02	012A	(1) White, Drywall, Homogeneous (2) White, Joint Compound, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	10% Cellulose Fiber None Reported
DW-C-03	013A	(1) White, Drywall, Homogeneous (2) White, Joint Compound, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	10% Cellulose Fiber None Reported
DW-C-04	014A	(1) White, Drywall, Homogeneous (2) White, Joint Compound, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	10% Cellulose Fiber None Reported
DW-C-05	015A	(1) White, Drywall, Homogeneous (2) White, Joint Compound, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	10% Cellulose Fiber None Reported
DW-C-06	016A	(1) White, Drywall, Homogeneous (2) White, Joint Compound, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	10% Cellulose Fiber None Reported
PW-D-01	017A	(1) White, Plaster, Homogeneous (2) Gray, Plaster, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
PW-D-02	018A	(1) White, Plaster, Homogeneous (2) Gray, Plaster, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
PW-D-03	019A	(1) White, Plaster, Homogeneous (2) Gray, Plaster, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
FT-E-01	020A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous <i>No Black Mastic</i>	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
FT-E-02	021A	(1) Gray, Floor Tile, Homogeneous <i>No Mastic</i>	NO ASBESTOS DETECTED	None Reported
FT-E-03	022A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous <i>No Black Mastic</i>	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported

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Respectfully submitted,  
PSI, Inc.

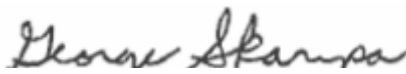


Approved Signatory  
George Skarupa

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-F-01	023A	(1) Gray, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	3% <b>Chrysotile</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
FT-F-02	024A	(1) Gray, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	3% <b>Chrysotile</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
FT-F-03	025A	(1) Gray, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	3% <b>Chrysotile</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
FT-G-01	026A	(1) Gray, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	3% <b>Chrysotile</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
FT-G-02	027A	(1) Gray, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	3% <b>Chrysotile</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
FT-G-03	028A	(1) Gray, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	3% <b>Chrysotile</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
FT-H-01	029A	(1) Black, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	3% <b>Chrysotile</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
FT-H-02	030A	(1) Black, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous <i>No Black Mastic</i>	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
FT-H-03	031A	(1) Black, Floor Tile, Homogeneous <i>No Mastic</i>	<b>NO ASBESTOS DETECTED</b>	None Reported
FT-I-01	032A	(1) Gray, Floor Tile, Homogeneous <i>No Mastic</i>	<b>NO ASBESTOS DETECTED</b>	30% Cellulose Fiber
FT-I-02	033A	(1) Gray, Floor Tile, Homogeneous <i>No Mastic</i>	<b>NO ASBESTOS DETECTED</b>	30% Cellulose Fiber
FT-I-03	034A	(1) Gray, Floor Tile, Homogeneous <i>No Mastic</i>	<b>NO ASBESTOS DETECTED</b>	30% Cellulose Fiber
FT-J-01	035A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
FT-J-02	036A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported

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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-J-03	037A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
FT-J-04	038A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
FT-K-01	039A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
FT-K-02	040A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
FT-K-03	041A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
CT-L-01	042A	(1) White, Ceiling Tile, Homogeneous	<b>NO ASBESTOS DETECTED</b>	20% Cellulose Fiber 50% Fibrous Glass
CT-L-02	043A	(1) White, Ceiling Tile, Homogeneous	<b>NO ASBESTOS DETECTED</b>	20% Cellulose Fiber 50% Fibrous Glass
CT-L-03	044A	(1) White, Ceiling Tile, Homogeneous	<b>NO ASBESTOS DETECTED</b>	20% Cellulose Fiber 50% Fibrous Glass
CT-L-04	045A	(1) White, Ceiling Tile, Homogeneous	<b>NO ASBESTOS DETECTED</b>	20% Cellulose Fiber 50% Fibrous Glass
CT-L-05	046A	(1) White, Ceiling Tile, Homogeneous	<b>NO ASBESTOS DETECTED</b>	20% Cellulose Fiber 50% Fibrous Glass
CT-M-01	047A	(1) White, Ceiling Tile, Homogeneous	<b>NO ASBESTOS DETECTED</b>	10% Fibrous Glass 60% Cellulose Fiber
CT-M-02	048A	(1) White, Ceiling Tile, Homogeneous	<b>NO ASBESTOS DETECTED</b>	10% Fibrous Glass 60% Cellulose Fiber
CT-M-03	049A	(1) White, Ceiling Tile, Homogeneous	<b>NO ASBESTOS DETECTED</b>	10% Fibrous Glass 60% Cellulose Fiber

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Respectfully submitted,  
PSI, Inc.



Approved Signatory  
George Skarupa

**Analyst:**

Preston Hunt

**Work Order:**

2202533

**Page: 5 of 6**

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-N-01	050A	(1) White, Ceiling Tile, Homogeneous	<b>NO ASBESTOS DETECTED</b>	10% Fibrous Glass 60% Cellulose Fiber
CT-N-02	051A	(1) White, Ceiling Tile, Homogeneous	<b>NO ASBESTOS DETECTED</b>	10% Fibrous Glass 60% Cellulose Fiber
CT-N-03	052A	(1) White, Ceiling Tile, Homogeneous	<b>NO ASBESTOS DETECTED</b>	10% Fibrous Glass 60% Cellulose Fiber
CT-N-04	053A	(1) White, Ceiling Tile, Homogeneous	<b>NO ASBESTOS DETECTED</b>	10% Fibrous Glass 60% Cellulose Fiber
CT-O-01	054A	(1) White, Ceiling Tile, Homogeneous	<b>NO ASBESTOS DETECTED</b>	2% Fibrous Glass 10% Cellulose Fiber
CT-O-02	055A	(1) White, Ceiling Tile, Homogeneous	<b>NO ASBESTOS DETECTED</b>	2% Fibrous Glass 10% Cellulose Fiber
CT-O-03	056A	(1) White, Ceiling Tile, Homogeneous	<b>NO ASBESTOS DETECTED</b>	2% Fibrous Glass 10% Cellulose Fiber
CT-O-04	057A	(1) White, Ceiling Tile, Homogeneous	<b>NO ASBESTOS DETECTED</b>	2% Fibrous Glass 10% Cellulose Fiber
PI-P-01	058A	(1) Gray, Pipe Wrap, Homogeneous	<b>50% Chrysotile</b>	None Reported
PI-P-02	059A	(1) Gray, Pipe Wrap, Homogeneous	<b>50% Chrysotile</b>	None Reported
PI-P-03	060A	(1) Gray, Pipe Wrap, Homogeneous	<b>50% Chrysotile</b>	None Reported
CB-Q-01	061A	(1) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b>	None Reported
CB-Q-02	062A	(1) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b>	None Reported
CB-Q-03	063A	(1) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b>	None Reported
CB-Q-04	064A	(1) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b>	None Reported

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Respectfully submitted,  
PSI, Inc.



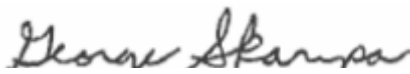
Approved Signatory  
George Skarupa

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)
CB-Q-05	065A	(1) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED	None Reported
CB-Q-06	066A	(1) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED	None Reported
WC-R-01	067A	(1) Gray, Caulking, Homogeneous	NO ASBESTOS DETECTED	None Reported
WC-R-02	068A	(1) Gray, Caulking, Homogeneous	NO ASBESTOS DETECTED	None Reported
WC-R-03	069A	(1) Gray, Caulking, Homogeneous	NO ASBESTOS DETECTED	None Reported
WC-R-04	070A	(1) Gray, Caulking, Homogeneous	NO ASBESTOS DETECTED	None Reported
SM-S-01	071A	(1) White, Sink Undercoating, Homogeneous	NO ASBESTOS DETECTED	7% Cellulose Fiber
SM-S-02	072A	(1) White, Sink Undercoating, Homogeneous	NO ASBESTOS DETECTED	7% Cellulose Fiber
SM-S-03	073A	(1) White, Sink Undercoating, Homogeneous	NO ASBESTOS DETECTED	7% Cellulose Fiber
DC-T-01	074A	(1) Green, Caulking, Homogeneous	NO ASBESTOS DETECTED	5% Wollastonite
DC-T-02	075A	(1) Green, Caulking, Homogeneous	NO ASBESTOS DETECTED	5% Wollastonite
DC-T-03	076A	(1) Green, Caulking, Homogeneous	NO ASBESTOS DETECTED	5% Wollastonite
DC-T-04	077A	(1) Green, Caulking, Homogeneous	NO ASBESTOS DETECTED	5% Wollastonite
CT-U-01	078A	(1) White, Ceiling Tile, Homogeneous	NO ASBESTOS DETECTED	10% Fibrous Glass 60% Cellulose Fiber
CT-U-02	079A	(1) White, Ceiling Tile, Homogeneous	NO ASBESTOS DETECTED	10% Fibrous Glass 60% Cellulose Fiber
CT-U-03	080A	(1) White, Ceiling Tile, Homogeneous	NO ASBESTOS DETECTED	10% Fibrous Glass 60% Cellulose Fiber
FT-Z-01	081A	(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**

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Respectfully submitted,  
PSI, Inc.



Approved Signatory  
George Skarupa

CHAIN OF CUSTODY - ASB/LEAD/IH

2202533 (2)



IH Laboratory  
850 Poplar Street  
Pittsburgh, PA 15220  
412-922-4000

102

**Project Information**

Project Name: Mizzou North - Haz Mat Survey  
 Project No: 00295291-1  
 PO Number: --  
 Sample Date: February 15, 2022

**Send Results To:**

Company: PSI, Inc.  
 Attn: Mr. Greg Chambliss  
 Address: 11826 Borman Drive  
 Telephone: 314/432-8073  
 Email: greg.chambliss@intertek.com

**Send Invoice To:**

Company: Same  
 Attn:  
 Address:  
 Telephone:  
 Email:

**Requested Turnaround Time:**

Same Day  1-2 Day  3-5 Day  Requested Date: 2/15/22

**Stop at First Positive**

Y  N

**Laboratory Use Only**

All Samples In Acceptable Condition: Y  N

Comments:  
 Shipping Charges Apply: Y  N

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	Other:
MN-RS-A-01.02.05.01	5	<input checked="" type="checkbox"/>																							Roofing System
MN-RF-B-01.02.05.01	5	<input checked="" type="checkbox"/>																							Roof Flashing
MN-Dw-C-01.02.05.01	6	<input checked="" type="checkbox"/>																							Drywall joint compound
MN-Pw-D-01.02.05.01	3	<input checked="" type="checkbox"/>																							Plaster wall
MN-FT-E-01.02.05.01	3	<input checked="" type="checkbox"/>																							Plaster Tile w/ black mastic
MN-FT-F-01.02.05.01	3	<input checked="" type="checkbox"/>																							Plaster Tile w/ black mastic
MN-FT-G-01.02.05.01	3	<input checked="" type="checkbox"/>																							Plaster Tile w/ black mastic

**Relinquished by:** *Matt...* **Date/Time:** 2/18/22

**Received by:** *Steven...* **Date/Time:** 2/21/22

**Analyst Name:** \_\_\_\_\_ **Analyst Signature:** \_\_\_\_\_

**Special Instructions / Comments:** Part 1 of 2 includes samples MN-RS-A-01 through MN-FT-Z-01 sw24uhm







## REPORT OF BULK SAMPLE ANALYSIS FOR ASBESTOS

TESTED FOR: **PSI, Inc**  
**11826 Borman Drive**  
**St. Louis, MO 63146**  
**Attn: Greg Chambliss**

Project ID: **0029-5291-1**  
**Mizzou North Hazmat Survey**  
**115 Business Loop 70 W**  
**Columbia, MO 65203**  
**Part 1 of 2**

Date Received: **3/1/2022**

Date Completed: **3/4/2022**

Date Reported: **3/4/2022**

Analyst: **Preston Hunt** Work Order: **2203022** Page: **1 of 7**

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)
MNDWC-07	001A	(1) White, Drywall, Homogeneous (2) White, Joint Compound, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	10% Cellulose Fiber None Reported
MNDWC-08	002A	(1) White, Drywall, Homogeneous (2) White, Joint Compound, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	10% Cellulose Fiber None Reported
MNDWC-09	003A	(1) White, Drywall, Homogeneous (2) White, Joint Compound, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	10% Cellulose Fiber None Reported
MNDWC-10	004A	(1) White, Drywall, Homogeneous (2) White, Joint Compound, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	10% Cellulose Fiber None Reported
MNDWC-11	005A	(1) White, Drywall, Homogeneous <i>No Joint Compound</i>	<b>NO ASBESTOS DETECTED</b>	10% Cellulose Fiber
MNDWC-12	006A	(1) White, Drywall, Homogeneous (2) White, Joint Compound, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	10% Cellulose Fiber None Reported
MNPWD-04	007A	(1) White, Plaster, Homogeneous	<b>NO ASBESTOS DETECTED</b>	None Reported
MNPWD-05	008A	(1) White, Plaster, Homogeneous (2) Gray, Plaster, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNPWD-06	009A	(1) White, Plaster, Homogeneous (2) Gray, Plaster, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported

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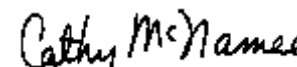
Respectfully submitted,  
PSI, Inc.

Approved Signatory  
Cathy McNamee

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)
MNPWD-07	010A	(1) White, Plaster, Homogeneous (2) Gray, Plaster, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNPWD-08	011A	(1) White, Plaster, Homogeneous (2) Gray, Plaster, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNPWD-09	012A	(1) White, Plaster, Homogeneous	<b>NO ASBESTOS DETECTED</b>	None Reported
MNPWD-10	013A	(1) White, Plaster, Homogeneous	<b>NO ASBESTOS DETECTED</b>	None Reported
MNFTE-04	014A	(1) White, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	3% <b>Chrysotile</b> 5% <b>Chrysotile</b>	None Reported None Reported
MNFTF-04	015A	(1) White, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	2% <b>Chrysotile</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTF-05	016A	(1) White, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	2% <b>Chrysotile</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTF-06	017A	(1) White, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	2% <b>Chrysotile</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTI-04	018A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	20% Cellulose Fiber None Reported
MNFTI-05	019A	(1) Gray, Floor Tile, Homogeneous <i>No Mastic</i>	<b>NO ASBESTOS DETECTED</b>	20% Cellulose Fiber
MNFTJ-05	020A	(1) Gray, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous <i>Inseparable Black and Yellow Mastics</i>	<b>NO ASBESTOS DETECTED</b> 2% <b>Chrysotile</b>	None Reported None Reported
MNFTJ-06	021A	(1) Gray, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous <i>Inseparable Black and Yellow Mastics</i>	<b>NO ASBESTOS DETECTED</b> 2% <b>Chrysotile</b>	None Reported None Reported
MNPIP-04	022A	(1) White, Pipe Insulation, Homogeneous	50% <b>Chrysotile</b>	None Reported
MNPIP-05	023A	(1) Gray, Pipe Insulation, Homogeneous	50% <b>Chrysotile</b>	None Reported
MNPIP-06	024A	(1) Gray, Pipe Insulation, Homogeneous	50% <b>Chrysotile</b>	None Reported

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Respectfully submitted,  
PSI, Inc.



Approved Signatory  
Cathy McNamee

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)
MNSMS-04	025A	(1) White, Sink Undercoating, Homogeneous	<b>NO ASBESTOS DETECTED</b>	7% Cellulose Fiber
MNDCT-05	026A	(1) Green, Caulking, Homogeneous	<b>NO ASBESTOS DETECTED</b>	None Reported
MNDWV-01	027A	(1) White, Drywall, Homogeneous (2) White, Joint Compound, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	10% Cellulose Fiber None Reported
MNDWV-02	028A	(1) White, Drywall, Homogeneous (2) White, Joint Compound, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	10% Cellulose Fiber None Reported
MNDWV-03	029A	(1) White, Drywall, Homogeneous (2) White, Joint Compound, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	10% Cellulose Fiber None Reported
MNSMW-01	030A	(1) Black, Sink Undercoating, Homogeneous	2% <b>Chrysotile</b>	None Reported
MNSMW-02	031A	(1) Black, Sink Undercoating, Homogeneous	2% <b>Chrysotile</b>	None Reported
MNSMW-03	032A	(1) Black, Sink Undercoating, Homogeneous	2% <b>Chrysotile</b>	None Reported
MNFTX-01	033A	(1) Gray, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> 3% <b>Chrysotile</b>	None Reported None Reported
MNFTX-02	034A	(1) Gray, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> 3% <b>Chrysotile</b>	None Reported None Reported
MNFTX-03	035A	(1) Gray, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> 3% <b>Chrysotile</b>	None Reported None Reported
MNFTX-04	036A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous <i>No Black Mastic</i>	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTX-05	037A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous <i>No Black Mastic</i>	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported

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Respectfully submitted,  
PSI, Inc.

*Cathy McNamee*

Approved Signatory  
Cathy McNamee

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)
MNFTX-06	038A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous <i>No Black Mastic</i>	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTY-01	039A	(1) Purple, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> 3% <b>Chrysotile</b>	None Reported None Reported
MNFTY-02	040A	(1) Purple, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> 3% <b>Chrysotile</b>	None Reported None Reported
MNFTY-03	041A	(1) Purple, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> 3% <b>Chrysotile</b>	None Reported None Reported
MNFTZ-02	042A	(1) Beige, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTZ-03	043A	(1) Gray, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	3% <b>Chrysotile</b> 5% <b>Chrysotile</b>	None Reported None Reported
MNFTZ-04	044A	(1) Beige, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTAA-01	045A	(1) Black, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> 3% <b>Chrysotile</b>	None Reported None Reported
MNFTAA-02	046A	(1) Black, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> 3% <b>Chrysotile</b>	None Reported None Reported
MNFTAA-03	047A	(1) Black, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> 3% <b>Chrysotile</b>	None Reported None Reported
MNFTAA-04	048A	(1) Black, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> 3% <b>Chrysotile</b>	None Reported None Reported
MNWCAC-03	049A	(1) White, Caulking, Homogeneous	<b>NO ASBESTOS DETECTED</b>	None Reported
MNFTAD-02	050A	(1) White, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous <i>Inseparable Black and Yellow Mastics</i>	<b>NO ASBESTOS DETECTED</b> 2% <b>Chrysotile</b>	None Reported None Reported
MNFTAD-03	051A	(1) White, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous <i>Inseparable Black and Yellow Mastics</i>	<b>NO ASBESTOS DETECTED</b> 2% <b>Chrysotile</b>	None Reported None Reported

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PSI, Inc.

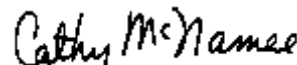
*Cathy McNamee*

Approved Signatory  
Cathy McNamee

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)
MNFTA-02	052A	(1) Black, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTA-03	053A	(1) Black, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous <i>Inseparable Black and Yellow Mastics</i>	<b>NO ASBESTOS DETECTED</b> 2% <b>Chrysotile</b>	None Reported None Reported
MNFTA-04	054A	(1) White, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	3% <b>Chrysotile</b> 5% <b>Chrysotile</b>	None Reported None Reported
MNFTA-04	055A	(1) White, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	3% <b>Chrysotile</b> 5% <b>Chrysotile</b>	None Reported None Reported
MNFTA-05	056A	(1) White, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	3% <b>Chrysotile</b> 5% <b>Chrysotile</b>	None Reported None Reported
MNFTA-06	057A	(1) White, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	3% <b>Chrysotile</b> 5% <b>Chrysotile</b>	None Reported None Reported
MNFTA-04	058A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTA-04	059A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTA-05	060A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTA-06	061A	(1) Gray, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous <i>Inseparable Black and Yellow Mastics</i>	<b>NO ASBESTOS DETECTED</b> 2% <b>Chrysotile</b>	None Reported None Reported
MNFTA-04	062A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNSMAO-04	063A	(1) Gray, Sink Undercoating, Homogeneous	<b>NO ASBESTOS DETECTED</b>	None Reported
MNCTAP-01	064A	(1) White, Ceiling Tile, Homogeneous	<b>NO ASBESTOS DETECTED</b>	20% Cellulose Fiber 50% Fibrous Glass

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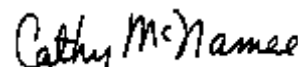


Approved Signatory  
Cathy McNamee

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)
MNCTAP-02	065A	(1) White, Ceiling Tile, Homogeneous	<b>NO ASBESTOS DETECTED</b>	20% Cellulose Fiber 50% Fibrous Glass
MNCTAP-03	066A	(1) White, Ceiling Tile, Homogeneous	<b>NO ASBESTOS DETECTED</b>	20% Cellulose Fiber 50% Fibrous Glass
MNFTAQ-01	067A	(1) Beige, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTAQ-02	068A	(1) Beige, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTAQ-03	069A	(1) Beige, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTAR-01	070A	(1) Purple, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTAR-02	071A	(1) Purple, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTAR-03	072A	(1) Purple, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTAR-04	073A	(1) Purple, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTAS-01	074A	(1) Blue, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> 2% <b>Chrysotile</b>	None Reported 5% Cellulose Fiber
MNFTAS-02	075A	(1) Blue, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> 5% <b>Chrysotile</b>	None Reported None Reported
MNFTAS-03	076A	(1) Blue, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> 3% <b>Chrysotile</b>	None Reported 2% Cellulose Fiber
MNFTAS-04	077A	(1) Blue, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported 5% Cellulose Fiber
MNMPAT-01	078A	(1) Brown, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b>	None Reported

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PSI, Inc.



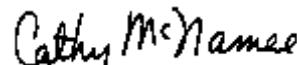
Approved Signatory  
Cathy McNamee

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)
MNMPAT-02	079A	(1) Brown, Mastic, Homogeneous	NO ASBESTOS DETECTED	None Reported
MNMPAT-03	080A	(1) Brown, Mastic, Homogeneous	NO ASBESTOS DETECTED	None Reported
MNMPAT-04	081A	(1) Brown, Mastic, Homogeneous	2% Chrysotile	None Reported
MNFTAU-01	082A	(1) Purple, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	NO ASBESTOS DETECTED 5% Chrysotile	None Reported None Reported
MNFTAU-02	083A	(1) Purple, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	NO ASBESTOS DETECTED 5% Chrysotile	None Reported None Reported
MNFTAU-03	084A	(1) Purple, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	NO ASBESTOS DETECTED 5% Chrysotile	None Reported None Reported
MNFTAU-04	085A	(1) Purple, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MNFTAU-05	086A	(1) Purple, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	NO ASBESTOS DETECTED 5% Chrysotile	None Reported None Reported

**Report Notes: (PT) Point Count Results**

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Respectfully submitted,  
PSI, Inc.



Approved Signatory  
Cathy McNamee



CHAIN OF CUSTODY ASB/LEAD/IH

2203022 (2)

intertek

IH Laboratory  
850 Poplar Street  
Pittsburgh, PA 15220  
412-922-4000

**Project Information**

Project Name: M:22-00 North Haz Mat Survey  
 Project No: 0029-5091-1  
 PO Number: US Business Loop 70, W. Columbia, Mo 65203  
 Sample Date: February 25, 2022

**Send Results To:**

Company: PSL Inc.  
 Attn: Mr. Greg Chamberliss  
 Address: 11826 Beaman Drive  
 Telephone: 314-432-8073  
 Email: greg\_chamberliss@intertek.com

**Send Invoice To:**

Company: Same  
 Attn:  
 Address:  
 Telephone:  
 Email:

**Requested Turnaround Time:**

Same Day  1-2 Day  3-5 Day  Requested Date: 3/04/22

**Stop at First Positive**

Y  N

**Laboratory Use Only**

All Samples In Acceptable Condition: Y  N   
 Comments:  
 Shipping Charges Apply: Y  N

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	Other:
MN-Dw-C-070809	6	<input checked="" type="checkbox"/>																							Hydral joint compound
MN-Plu-D-04050607	7	<input checked="" type="checkbox"/>																							Plaster walls
MN-FT-E-04	1	<input checked="" type="checkbox"/>																							Fiber Tile w/ Black matrix
MN-FT-F-040506	3	<input checked="" type="checkbox"/>																							Fiber Tile w/ Black matrix
MN-FT-I-0405	2	<input checked="" type="checkbox"/>																							Fiber Tile w/ Black matrix
MN-FT-J-0506	2	<input checked="" type="checkbox"/>																							Fiber Tile w/ Black matrix
MN-FT-P-040506	3	<input checked="" type="checkbox"/>																							Fiber Tile w/ Black matrix

**Relinquished by** \_\_\_\_\_ **Date/Time** \_\_\_\_\_

**Received by** *gwenashel* **Date/Time** 3/1/22

**Analyst Name:** \_\_\_\_\_ **Analyst Signature:** \_\_\_\_\_

**Special Instructions / Comments:** Part 1 of 2 includes Samples MN-DW-C-07 through MN-FT-AU-05 SW 3/1/22

2203022

Sample Number	# of Samples	Analysis	Sample Description
MN-SM-S-04	1	PLM	Sink Mastic - white
MN-DC-T-05	1	PLM	Duct Caulking - Green
MN-DW-V-01,02,03	3	PLM	Drywall joint compound - textured
MN-SM-W-01,02,03	3	PLM	Sink mastic - black
MN-FT-X- <sup>01,02,03,04,05</sup> <sub>06</sub>	6	PLM	Floor tile w/ black mastic
MN-FT-Y-01,02,03	3	PLM	Floor tile w/ black mastic
MN-FT-Z-02,03,04	3	PLM	Floor tile w/ yellow or black mastic
MN-FT-AA-01,02,03,04	4	PLM	Floor tile w/ black mastic
MN-UC-AC-03	1	PLM	Window caulking - white
MN-FT-AD-02,03	2	PLM	Floor tile w/ yellow mastic
MN-FT-AE-02,03	2	PLM	Floor tile w/ yellow mastic
MN-FT-AJ-04	1	PLM	Floor tile w/ black mastic
MN-FT-Ak-04,05,06	3	PLM	Floor tile w/ black mastic
MN-FT-AL-04	1	PLM	Floor tile w/ yellow mastic
MN-FT-AM-04,05,06	3	PLM	Floor tile w/ yellow or black mastic
MN-FT-AN-04	1	PLM	Floor tile w/ yellow mastic
MN-SM-AO-04	1	PLM	Sink mastic - grey
MN-CT-AP-01,02,03	3	PLM	Ceiling tile - 2x2 textured
MN-FT-AQ-01,02,03	3	PLM	Floor tile w/ yellow mastic
MN-FT-AR-01,02,03,04	4	PLM	Floor tile w/ yellow mastic
MN-FT-AS-01,02,03,04	4	PLM	Floor tile w/ black mastic
MN-MP-AT-01,02,03,04	4	PLM	Mastic patches - dark brown
MN-FT-AU-01,02,03,04,05	5	PLM	Floor tile w/ yellow or black mastic
MN-FT-AV-01,02,03	3	PLM	Floor tile w/ yellow mastic
MN-FT-AW-01,02,03	3	PLM	Floor tile w/ yellow mastic
MN-FT-AX-01,02,03,04	4	PLM	Floor tile w/ black mastic
MN-FT-AY-01,02,03,04	4	PLM	Floor tile w/ black mastic
MN-FT-AZ-01,02,03	3	PLM	Floor tile w/ black mastic
MN-FT-BA-01,02,03	3	PLM	Floor tile w/ black mastic
MN-FT-BB-01,02,03,04	4	PLM	Floor tile w/ black mastic
MN-FT-BC-01,02,03	3	PLM	Ceiling tile - 2x2 textured - popcorn
MN-UC-BE-01,02,03	3	PLM	Vibration cloth
MN-DI-BG-01,02,03	3	PLM	Duct insulation
MN-FT-BH-01,02,03	3	PLM	Floor tile w/ yellow mastic
MN-LS-BI-01,02,03	3	PLM	Linoleum sheeting
MN-CT-BJ-01,02,03	3	PLM	Ceiling tile - 1x1 w/ mastic patch
MN-FT-Bk-01,02,03	3	PLM	Floor tiles w/ yellow mastic
MN-FT-BL-01,02,03	3	PLM	Floor tiles w/ yellow mastic
MN-CT-BM-01,02,03	3	PLM	Ceiling tiles - 2x4 textured
MN-LS-BN-01,02,03	3	PLM	Linoleum sheeting
MN-FT-BO-01,02,03	3	PLM	Floor tiles w/ yellow mastic
MN-UG-BP-01,02,03	3	PLM	Window glazing
MN-LS-BQ-01,02,03	3	PLM	Linoleum sheeting
MN-CS-BR-01,02,03	3	PLM	Popcorn ceiling material
MN-LS-BS-01,02,03	3	PLM	Linoleum sheeting

SW 3/1/2022



## REPORT OF BULK SAMPLE ANALYSIS FOR ASBESTOS

TESTED FOR: **PSI, Inc**  
**11826 Borman Drive**  
**St. Louis, MO 63146**  
**Attn: Greg Chambliss**

Project ID: **00295291-1**  
**Mizzou North - Haz Mat Survey**  
**115 Business Loop 70 W, Columbia, MO 65203**  
**Part 2 of 2; Prefix: MN-**

Date Received: **2/21/2022**

Date Completed: **2/24/2022**

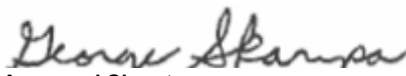
Date Reported: **2/24/2022**

Analyst: **Preston Hunt** Work Order: **2202534** Page: **1 of 3**

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)
WC-AC-01	001A	(1) White, Caulking, Homogeneous	<b>NO ASBESTOS DETECTED</b>	None Reported
WC-AC-02	002A	(1) White, Caulking, Homogeneous	<b>NO ASBESTOS DETECTED</b>	None Reported
FT-AD-01	003A	(1) White, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
FT-AE-01	004A	(1) Black, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous <i>Inseparable Black and Yellow Mastics</i>	<b>NO ASBESTOS DETECTED</b> <b>3% Chrysotile</b>	None Reported None Reported
FT-AF-01	005A	(1) Blue, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	<b>3% Chrysotile</b> <b>5% Chrysotile</b>	None Reported None Reported
FT-AF-02	006A	(1) Blue, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	<b>3% Chrysotile</b> <b>5% Chrysotile</b>	None Reported None Reported
FT-AF-03	007A	(1) Blue, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	<b>3% Chrysotile</b> <b>5% Chrysotile</b>	None Reported None Reported
FT-AG-01	008A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
FT-AG-02	009A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
FT-AG-03	010A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
LS-AH-01	011A	(1) Gray, Linoleum, Homogeneous	<b>NO ASBESTOS DETECTED</b>	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.

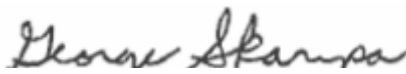
Respectfully submitted,  
PSI, Inc.

  
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)
LS-AH-02	012A	(1) Gray, Linoleum, Homogeneous	NO ASBESTOS DETECTED		None Reported
LS-AH-03	013A	(1) Gray, Linoleum, Homogeneous	NO ASBESTOS DETECTED		None Reported
FP-AI-01	014A	(1) Gray, Fireproofing, Homogeneous	NO ASBESTOS DETECTED		5% Fibrous Glass 7% Cellulose Fiber
FP-AI-02	015A	(1) Gray, Fireproofing, Homogeneous	NO ASBESTOS DETECTED		5% Fibrous Glass 7% Cellulose Fiber
FP-AI-03	016A	(1) Gray, Fireproofing, Homogeneous	NO ASBESTOS DETECTED		5% Fibrous Glass 7% Cellulose Fiber
FT-AJ-01	017A	(1) Tan, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	3%	Chrysotile	None Reported
			5%	Chrysotile	None Reported
FT-AJ-02	018A	(1) Tan, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	3%	Chrysotile	None Reported
			5%	Chrysotile	None Reported
FT-AJ-03	019A	(1) Tan, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	3%	Chrysotile	None Reported
			5%	Chrysotile	None Reported
FT-AK-01	020A	(1) Beige, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	3%	Chrysotile	None Reported
			5%	Chrysotile	None Reported
FT-AK-02	021A	(1) Beige, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	3%	Chrysotile	None Reported
			5%	Chrysotile	None Reported
FT-AK-03	022A	(1) Beige, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	3%	Chrysotile	None Reported
			5%	Chrysotile	None Reported
FT-AL-01	023A	(1) White, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED		None Reported
			NO ASBESTOS DETECTED		None Reported
FT-AL-02	024A	(1) White, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED		None Reported
			NO ASBESTOS DETECTED		None Reported
FT-AL-03	025A	(1) White, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED		None Reported
			NO ASBESTOS DETECTED		None Reported
FT-AM-01	026A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED		None Reported
			NO ASBESTOS DETECTED		None Reported

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Respectfully submitted,  
PSI, Inc.



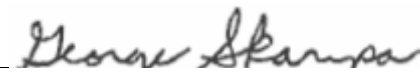
Approved Signatory  
George Skarupa

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-AM-02	027A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED		None Reported None Reported
FT-AM-03	028A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED		None Reported None Reported
FT-AN-01	029A	(1) Brown, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous <i>No Yellow Mastic in this Group</i>	3% 5%	Chrysotile Chrysotile	None Reported None Reported
FT-AN-02	030A	(1) Brown, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	3% 5%	Chrysotile Chrysotile	None Reported None Reported
FT-AN-03	031A	(1) Brown, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	3% 5%	Chrysotile Chrysotile	None Reported None Reported
SM-AO-01	032A	(1) Gray, Sink Undercoating, Homogeneous	NO ASBESTOS DETECTED		7% Cellulose Fiber
SM-AO-02	033A	(1) Gray, Sink Undercoating, Homogeneous	NO ASBESTOS DETECTED		7% Cellulose Fiber
SM-AO-03	034A	(1) Gray, Sink Undercoating, Homogeneous	NO ASBESTOS DETECTED		7% Cellulose Fiber

**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 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

2202533 (2)  
SW 2/21/2022

intertek

IH Laboratory  
850 Poplar Street  
Pittsburgh, PA 15220  
412-922-4000

102 2202534(2)

Project Information	
Project Name:	Mizzou North - Haz Mat Survey
Project No:	00295291-1
PO Number:	115 Business Loop 70 W, Columbia, MO 65203
Sample Date:	February 15, 2022
Send Results To:	
Company:	PSI, Inc.
Attn:	Mr. Greg Chambliss
Address:	11826 Borman Drive
Telephone:	314/432-8073
Email:	greg.chambliss@intertek.com

Send Invoice To:	
Company:	Same
Attn:	
Address:	
Telephone:	
Email:	

Requested Turnaround Time:	
Same Day	<input type="checkbox"/>
1-2 Day	<input type="checkbox"/>
3-5 Day	<input checked="" type="checkbox"/>
Requested Date:	2/25/22

Stop at First Positive	
Y	<input type="checkbox"/>
N	<input checked="" type="checkbox"/>

Laboratory Use Only	
All Samples In Acceptable Condition:	Y <input type="checkbox"/> N <input type="checkbox"/>
Comments:	
Shipping Charges Apply:	<input type="checkbox"/>

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	Other:
MN-RS-A-01,02,03	5	<input checked="" type="checkbox"/>																							Roofing System
MN-RF-B-01,02,03	3	<input checked="" type="checkbox"/>																							Roof Flashing
MN-DW-C-01,02,03	3	<input checked="" type="checkbox"/>																							Drywall joint compound
MN-PW-D-01,02,03	3	<input checked="" type="checkbox"/>																							Plaster wall
MN-PT-E-01,02,03	3	<input checked="" type="checkbox"/>																							Floor Tile w/ black mastic
MN-PT-F-01,02,03	3	<input checked="" type="checkbox"/>																							Floor Tile w/ black mastic
MN-PT-G-01,02,03	3	<input checked="" type="checkbox"/>																							Floor Tile w/ black mastic

Relinquished by	Date/Time	Received by	Date/Time
M. Chambliss	2/18/22	Greg Chambliss	2/21/22
			9e

Analyst Name:		Analyst Signature:	
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Special Instructions / Comments: Part 2 of 2 includes samples MN-WC-AC-01 through MN-SM-AO-03 SW 2/21/2022





## REPORT OF BULK SAMPLE ANALYSIS FOR ASBESTOS

TESTED FOR: **PSI, Inc**  
**11826 Borman Drive**  
**St. Louis, MO 63146**  
**Attn: Greg Chambliss**

Project ID: **0029-5291-1**  
**Mizzou North Hazmat Survey**  
**115 Business Loop 70 W**  
**Columbia, MO 65203; Part 2 of 2**

Date Received: **3/1/2022**

Date Completed: **3/2/2022**

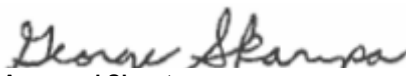
Date Reported: **3/2/2022**

Analyst: **Lori Huss** Work Order: **2203023** Page: **1 of 6**

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)
MNFTAV-01	001A	(1) Brown, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTAV-02	002A	(1) Brown, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTAV-03	003A	(1) Brown, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTAW-01	004A	(1) Brown, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTAW-02	005A	(1) Brown, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTAW-03	006A	(1) Brown, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	None Reported None Reported
MNFTAX-01	007A	(1) Brown, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	<b>2% Chrysotile</b> <b>5% Chrysotile</b>	None Reported None Reported
MNFTAX-02	008A	(1) Brown, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	<b>2% Chrysotile</b> <b>5% Chrysotile</b>	None Reported None Reported
MNFTAX-03	009A	(1) Green, Mastic, Homogeneous (2) Brown, Floor Tile, Homogeneous (3) Black, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>2% Chrysotile</b> <b>5% Chrysotile</b>	None Reported None Reported None Reported
MNFTAX-04	010A	(1) Brown, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	<b>2% Chrysotile</b> <b>5% Chrysotile</b>	None Reported None Reported

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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)
MNFTAY-01	011A	(1) Gray, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MNFTAY-02	012A	(1) Gray, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MNFTAY-03	013A	(1) Gray, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MNFTAY-04	014A	(1) Gray, Floor Tile, Homogeneous (2) Brown, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MNFTAZ-01	015A	(1) White, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MNFTAZ-02	016A	(1) White, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MNFTAZ-03	017A	(1) White, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MNFTBA-01	018A	(1) Gray, Floor Tile, Homogeneous (2) Brown, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MNFTBA-02	019A	(1) Gray, Floor Tile, Homogeneous (2) Brown, Mastic, Homogeneous <i>Inseparable Brown and Black Mastic</i>	NO ASBESTOS DETECTED 3% Chrysotile	None Reported None Reported
MNFTBA-03	020A	(1) Gray, Floor Tile, Homogeneous (2) Brown, Mastic, Homogeneous <i>Inseparable Brown and Black Mastic</i>	NO ASBESTOS DETECTED 3% Chrysotile	None Reported None Reported
MNFTBB-01	021A	(1) Green, Floor Tile, Homogeneous (2) Black, Mastic, Homogeneous <i>Inseparable Black and Yellow Mastic</i>	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MNFTBB-02	022A	(1) Green, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MNFTBB-03	023A	(1) Green, Floor Tile, Homogeneous (2) Yellow, Mastic, 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.

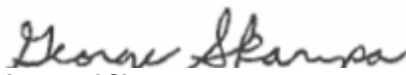


Approved Signatory  
George Skarupa

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)
MNFTBB-04	024A	(1) Green, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MNCTBC-01	025A	(1) White, Ceiling Tile, Homogeneous	NO ASBESTOS DETECTED	35% Cellulose Fiber 35% Fibrous Glass
MNCTBC-02	026A	(1) White, Ceiling Tile, Homogeneous	NO ASBESTOS DETECTED	35% Cellulose Fiber 35% Fibrous Glass
MNCTBC-03	027A	(1) White, Ceiling Tile, Homogeneous	NO ASBESTOS DETECTED	35% Cellulose Fiber 35% Fibrous Glass
MNVCBF-01	028A	(1) Black, Other, Homogeneous <i>Vibration Cloth</i>	NO ASBESTOS DETECTED	10% Synthetic Fiber
MNVCBF-02	029A	(1) Black, Other, Homogeneous <i>Vibration Cloth</i>	NO ASBESTOS DETECTED	10% Synthetic Fiber
MNVCBF-03	030A	(1) Black, Other, Homogeneous <i>Vibration Cloth</i>	NO ASBESTOS DETECTED	10% Synthetic Fiber
MNDIBG-01	031A	(1) Tan, Insulation, Homogeneous	NO ASBESTOS DETECTED	95% Cellulose Fiber
MNDIBG-02	032A	(1) Tan, Insulation, Homogeneous	NO ASBESTOS DETECTED	95% Cellulose Fiber
MNDIBG-03	033A	(1) Tan, Insulation, Homogeneous	NO ASBESTOS DETECTED	95% Cellulose Fiber
MNFTBH-01	034A	(1) Pink, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MNFTBH-02	035A	(1) Pink, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MNFTBH-03	036A	(1) Pink, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MNLSBI-01	037A	(1) Pink, Linoleum, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	15% Cellulose Fiber None Reported
MNLSBI-02	038A	(1) Pink, Linoleum, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	15% 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.

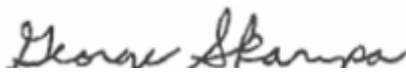
Respectfully submitted,  
PSI, Inc.

  
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)
MNLSBI-03	039A	(1) Pink, Linoleum, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	15% Cellulose Fiber None Reported
MNCTBJ-01	040A	(1) White, Ceiling Tile, Homogeneous (2) Brown, Glue, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	100% Cellulose Fiber None Reported
MNCTBJ-02	041A	(1) White, Ceiling Tile, Homogeneous (2) Brown, Glue, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	100% Cellulose Fiber None Reported
MNCTBJ-03	042A	(1) White, Ceiling Tile, Homogeneous (2) Brown, Glue, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	100% Cellulose Fiber None Reported
MNFTBK-01	043A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MNFTBK-02	044A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MNFTBK-03	045A	(1) Gray, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MNFTBL-01	046A	(1) Blue, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MNFTBL-02	047A	(1) Blue, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MNFTBL-03	048A	(1) Blue, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous <i>Inseparable Yellow and Black Mastic</i>	NO ASBESTOS DETECTED 5% Chrysotile	None Reported None Reported
MNCTBM-01	049A	(1) White, Ceiling Tile, Homogeneous	NO ASBESTOS DETECTED	35% Cellulose Fiber 35% Fibrous Glass
MNCTBM-02	050A	(1) White, Ceiling Tile, Homogeneous	NO ASBESTOS DETECTED	35% Cellulose Fiber 35% Fibrous Glass
MNCTBM-03	051A	(1) White, Ceiling Tile, Homogeneous	NO ASBESTOS DETECTED	35% Cellulose Fiber 35% Fibrous Glass
MNLSBN-01	052A	(1) White, Linoleum, Homogeneous	NO ASBESTOS DETECTED	None Reported

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Respectfully submitted,  
PSI, Inc.

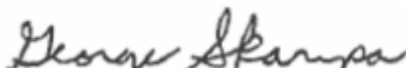


Approved Signatory  
George Skarupa

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)
MNLSBN-02	053A	(1) White, Linoleum, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MNLSBN-03	054A	(1) White, Linoleum, Homogeneous (2) Yellow, Mastic, Homogeneous <i>Inseparable Yellow and Black Mastic</i>	NO ASBESTOS DETECTED < 1% Chrysotile	None Reported None Reported
MNFTBO-01	055A	(1) White, Floor Tile, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported
MNFTBO-02	056A	(1) Transparent, Mastic, Homogeneous (2) White, Floor Tile, Homogeneous (3) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported None Reported
MNFTBO-03	057A	(1) Transparent, Mastic, Homogeneous (2) White, Floor Tile, Homogeneous (3) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED NO ASBESTOS DETECTED	None Reported None Reported None Reported
MNWGBP-01	058A	(1) Tan, Glazing, Homogeneous	NO ASBESTOS DETECTED	None Reported
MNWGBP-02	059A	(1) Tan, Glazing, Homogeneous	NO ASBESTOS DETECTED	None Reported
MNWGBP-03	060A	(1) Tan, Glazing, Homogeneous	NO ASBESTOS DETECTED	None Reported
MNLSBQ-01	061A	(1) Blue, Linoleum, Homogeneous (2) Brown, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	15% Cellulose Fiber None Reported
MNLSBQ-02	062A	(1) Blue, Linoleum, Homogeneous (2) Brown, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	15% Cellulose Fiber None Reported
MNLSBQ-03	063A	(1) Blue, Linoleum, Homogeneous (2) Brown, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	15% Cellulose Fiber None Reported
MNCSBR-01	064A	(1) White, Popcorn Ceiling, Homogeneous	NO ASBESTOS DETECTED	7% Polyethylene
MNCSBR-02	065A	(1) White, Popcorn Ceiling, Homogeneous	NO ASBESTOS DETECTED	7% Polyethylene
MNCSBR-03	066A	(1) White, Popcorn Ceiling, Homogeneous	NO ASBESTOS DETECTED	7% Polyethylene
MNLSBS-01	067A	(1) Brown, Linoleum, Homogeneous (2) Yellow, Mastic, Homogeneous	NO ASBESTOS DETECTED NO ASBESTOS DETECTED	10% 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.



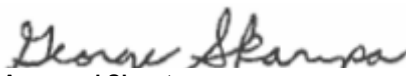
Approved Signatory  
George Skarupa

<b>Client ID</b>	<b>Lab ID (Layer)</b>	<b>Sample Description (Color, Texture, Etc.) <i>Analyst's Comment</i></b>	<b>Asbestos Content (Percent and Type)</b>	<b>Non-asbestos Fibers (Percent and Type)</b>
MNLSBS-02	068A	(1) Brown, Linoleum, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	10% Cellulose Fiber None Reported
MNLSBS-03	069A	(1) Brown, Linoleum, Homogeneous (2) Yellow, Mastic, Homogeneous	<b>NO ASBESTOS DETECTED</b> <b>NO ASBESTOS DETECTED</b>	10% Cellulose Fiber 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 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

2203023 (2)

Intertek

IH Laboratory  
850 Poplar Street  
Pittsburgh, PA 15220  
412-922-4000

**Project Information**

Project Name: Mizzou North Haz Mat Survey  
 Project No: 0029-5291-1  
 PO Number: 115 Business Loop 70, W. Columbia, MO 65203  
 Sample Date: February 25, 2008

**Send Results To:**

Company: PSI, Inc.  
 Attn: Mr. Greg Chamberling  
 Address: 11826 Balmora Drive  
 Telephone: 314-438-8073  
 Email: gregs.chamberling@intertek.com

**Send Invoice To:**

Company: Same  
 Attn: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Telephone: \_\_\_\_\_  
 Email: \_\_\_\_\_

**Requested Turnaround Time:**

Same Day  1-2 Day  3-5 Day  Requested Date: 3/04/22

**Stop at First Positive**

Y  N

**Laboratory Use Only**

All Samples In Acceptable Condition: Y  N   
 Comments: \_\_\_\_\_  
 Shipping Charges Apply: Y  N

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	Other:
<del>MN-Dw-C-070809</del>	<del>6</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>Asphalt Joint Compound</del>
<del>MN-Plw-D-030508</del>	<del>7</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>Plaster walls</del>
<del>MN-FT-E-04</del>	<del>1</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>Fluor Tile w/ Black mastic</del>
<del>MN-FT-F-040506</del>	<del>3</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>Fluor Tile w/ Black mastic</del>
<del>MN-FT-I-0405</del>	<del>2</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>Fluor Tile w/ yellow mastic</del>
<del>MN-FT-J-0506</del>	<del>2</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>Fluor Tile w/ yellow mastic</del>
<del>MN-PI-P-0406</del>	<del>3</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>✓</del>	<del>T61 pipe insulation</del>

**Relinquished by:** \_\_\_\_\_ **Date/Time:** \_\_\_\_\_

**Received by:** Juenski **Date/Time:** 3/1/2008

**Analyst Name:** \_\_\_\_\_ **Analyst Signature:** \_\_\_\_\_

**Special Instructions / Comments:** Part 2 of 2 includes samples MN-FT-AV-01 through

MN-LS-BS-03 SW 3/1/2008

2203023

Sample Number	# of Samples	Analysis	Sample Description
MN-SM-S-04	1	PLM	Sink Mastic - white
MN-DC-T-05	1	PLM	Duct Caulking - Green
MN-DUX-V-01,02,03	3	PLM	Drywall joint compound - textured
MN-SM-W-01,02,03	3	PLM	Sink mastic - black
MN-FT-X-01,02,03,04,05,06	6	PLM	Floor Tile w/ black mastic
MN-FT-Y-01,02,03	3	PLM	Floor Tile w/ black mastic
MN-FT-Z-02,03,04	3	PLM	Floor Tile w/ yellow or black mastic
MN-FT-AA-01,02,03,04	4	PLM	Floor tile w/ black mastic
MN-UC-AC-03	1	PLM	Window caulking - white
MN-FT-AD-02,03	2	PLM	Floor tile w/ yellow mastic
MN-FT-AE-02,03	2	PLM	Floor tile w/ yellow mastic
MN-FT-AJ-04	1	PLM	Floor tile w/ black mastic
MN-FT-AK-04,05,06	3	PLM	floor tile w/ black mastic
MN-FT-AL-04	1	PLM	Floor tile w/ yellow mastic
MN-FT-AM-04,05,06	3	PLM	Floor tile w/ yellow or black mastic
MN-FT-AN-04	1	PLM	Floor tile w/ yellow mastic
MN-SM-AO-04	1	PLM	Sink mastic - grey
MN-CT-AP-01,02,03	3	PLM	Ceiling Tile - 2x2 textured
MN-FT-AQ-01,02,03	3	PLM	Floor Tile w/ yellow mastic
MN-FT-AR-01,02,03,04	4	PLM	Floor tile w/ yellow mastic
MN-FT-AS-01,02,03,04	4	PLM	Floor Tile w/ black mastic
MN-MP-AT-01,02,03,04	4	PLM	Mastic patches - dark brown
MN-FT-AU-01,02,03,04,05	5	PLM	Floor tile w/ yellow or black mastic
MN-FT-AV-01,02,03	3	PLM	Floor tile w/ yellow mastic
MN-FT-AW-01,02,03	3	PLM	Floor tile w/ yellow mastic
MN-FT-AX-01,02,03,04	4	PLM	Floor tile w/ black mastic
MN-FT-AY-01,02,03,04	4	PLM	Floor tile w/ black mastic
MN-FT-AZ-01,02,03	3	PLM	Floor tile w/ black mastic
MN-FT-BA-01,02,03	3	PLM	Floor tile w/ black mastic
MN-FT-BB-01,02,03,04	4	PLM	Floor tile w/ black mastic
MN-FT-BC-01,02,03	3	PLM	Ceiling tile - 2x2 textured - popcorn
MN-VC-BF-01,02,03	3	PLM	Vibration cloth
MN-DI-BG-01,02,03	3	PLM	Duct Insulation
MN-FT-BH-01,02,03	3	PLM	Floor tile w/ yellow mastic
MN-LS-BI-01,02,03	3	PLM	Linoleum sheeting
MN-CT-BJ-01,02,03	3	PLM	Ceiling tile - 1x1 w/ mastic patch
MN-FT-BK-01,02,03	3	PLM	Floor tiles w/ yellow mastic
MN-FT-BL-01,02,03	3	PLM	Floor tiles w/ yellow mastic
MN-CT-BM-01,02,03	3	PLM	Ceiling tiles - 2x4 textured
MN-LS-BN-01,02,03	3	PLM	Linoleum sheeting
MN-FT-BO-01,02,03	3	PLM	Floor tiles w/ yellow mastic
MN-WG-BP-01,02,03	3	PLM	Window glazing
MN-LS-BQ-01,02,03	3	PLM	Linoleum sheeting
MN-CS-BR-01,02,03	3	PLM	Popcorn ceiling material
MN-LS-BS-01,02,03	3	PLM	Linoleum sheeting

sw3/1/2022



## REPORT OF BULK SAMPLE ANALYSIS FOR ASBESTOS

TESTED FOR: PSI, Inc  
11826 Borman Drive  
St. Louis, MO 63146  
Attn: Greg Chambliss

Project ID: 0029-5291-1  
Mizzou N. Hazmat Srv.  
115 Bns Loop 70 W, Columbia, MO  
Original WO: 2203023

Date Received: 3/3/2022

Date Completed: 3/3/2022

Date Reported: 3/3/2022

Analyst: Dan Anderson      Work Order: 2203084      Page: 1 of 1

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)
MNLSBN-03	001A	(1) Yellow, Mastic, Homogeneous <i>Inseparable Yellow and Black Mastic</i>	< 1%      CHRYSOTILE (PT)	None Reported

Report Notes: (PT) Point Count Results

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Respectfully submitted,  
PSI, Inc.

Approved Signatory  
Cathy McNamee





## **APPENDIX B**

### **TABLE 1 RCRA METALS TESTING DATA RESULTS**

**TABLE 1**  
**RCRA METALS TEST DATA RESULTS**  
**UNIVERSITY OF MISSOURI - COLUMBIA**  
**MIZZOU NORTH**

RCRA METAL TEST DATA											LOCATION			
TEST NUMBER	Ag	As	Ba	Cd	Cr	Hg	Pb	Se	Room Number	Wall	Component	Substrate	Paint Color	
	SYSTEM CHECK													
	SYSTEM CHECK													
Calibration	491	484	733	486	624	< LOD	489	533						
13	113	14	987	34	< LOD	< LOD	< LOD	< LOD	39J	E	WALL	CONCRETE	TAN	
14	113	< LOD	1,022	34	< LOD	< LOD	< LOD	< LOD	39J	E	WALL	CONCRETE	TAN	
15	153	< LOD	1,394	46	< LOD	< LOD	< LOD	< LOD	39J	N	COLUMN	CONCRETE	TAN	
16	< LOD	< LOD	412	< LOD	< LOD	< LOD	< LOD	< LOD	39J	W	WALL	CMU	WHITE	
17	< LOD	< LOD	419	< LOD	< LOD	< LOD	< LOD	< LOD	39J	W	WALL	CMU	WHITE	
18	< LOD	< LOD	374	< LOD	< LOD	< LOD	< LOD	< LOD	45A	W	WALL	CMU	WHITE	
19	< LOD	< LOD	451	< LOD	< LOD	< LOD	< LOD	< LOD	45A	N	WALL	CMU	WHITE	
20	< LOD	< LOD	924	28	< LOD	< LOD	< LOD	< LOD	45A	N	WALL	CONCRETE	WHITE	
21	< LOD	< LOD	949	20	< LOD	< LOD	< LOD	< LOD	45A	E	WALL	CONCRETE	WHITE	
22	< LOD	< LOD	557	27	< LOD	< LOD	< LOD	< LOD	45A	N	COLUMN	CONCRETE	WHITE	
Calibration	489	448	781	483	524	< LOD	495	521						
Calibration	465	465	684	493	438	< LOD	494	540						
27	126	23	2,344	23	< LOD	< LOD	< LOD	< LOD	704	N	WALL	BRICK	LT. GREEN	
28	< LOD	< LOD	2,545	< LOD	< LOD	< LOD	88	< LOD	704	N	WALL	BRICK	LT. GREEN	
29	< LOD	< LOD	2,479	< LOD	< LOD	< LOD	87	< LOD	704	W	WALL	BRICK	LT. GREEN	
Calibration	495	482	747	512	553	< LOD	512	528						
Calibration	533	459	876	517	542	< LOD	500	537						
32	< LOD	42	746	< LOD	< LOD	< LOD	90	< LOD	803	S	WALL	BRICK	PINKISH-BROWN	
33	< LOD	26	3,145	< LOD	< LOD	< LOD	37	< LOD	803	E	WALL	BRICK	PINKISH-BROWN	
34	< LOD	64	3,369	< LOD	< LOD	48	247	< LOD	803	N	WALL	BRICK	PINKISH-BROWN	

**TABLE 1**  
**RCRA METALS TEST DATA RESULTS**  
**UNIVERSITY OF MISSOURI - COLUMBIA**  
**MISSOURI NORTH**

RCRA METAL TEST DATA											LOCATION			
TEST NUMBER	Ag	As	Ba	Cd	Cr	Hg	Pb	Se	Room Number	Wall	Component	Substrate	Paint Color	
35	< LOD	< LOD	290	< LOD	< LOD	< LOD	460	< LOD	STAIRWELL D - GROUND	W	COLUMN	CONCRETE	WHITE	
36	140	< LOD	6,573	29	< LOD	< LOD	2,794	< LOD	STAIRWELL D - MEZZANINE	-	CEILING	CONCRETE	WHITE	
37	< LOD	< LOD	776	20	< LOD	< LOD	< LOD	< LOD	STAIRWELL D - 6TH FLOOR	W	STAIRS	CONCRETE	WHITE	
38	< LOD	< LOD	438	< LOD	< LOD	< LOD	< LOD	< LOD	C003	S	WALL	CMU	TAN	
39	< LOD	< LOD	330	< LOD	< LOD	< LOD	< LOD	< LOD	C006	E	WALL	CMU	TAN	
40	< LOD	14	387	< LOD	< LOD	< LOD	< LOD	< LOD	C004	N	WALL	CMU	TAN	
41	< LOD	10	391	< LOD	< LOD	< LOD	< LOD	< LOD	25	W	WALL	CMU	LT. BLUE	
42	< LOD	< LOD	522	< LOD	< LOD	13	< LOD	< LOD	25	S	WALL	CMU	LT. BLUE	
43	< LOD	< LOD	247	< LOD	< LOD	< LOD	< LOD	< LOD	C004	N	WALL	CMU	CREAM	
44	< LOD	< LOD	300	< LOD	< LOD	< LOD	< LOD	< LOD	C004	S	WALL	CMU	CREAM	
45	< LOD	< LOD	314	< LOD	< LOD	< LOD	< LOD	< LOD	C004	E	WALL	CMU	CREAM	
46	< LOD	< LOD	394	< LOD	< LOD	< LOD	< LOD	< LOD	27D	S	COLUMN	CONCRETE	WHITE	
47	< LOD	< LOD	999	29	< LOD	< LOD	< LOD	< LOD	C005	N	WALL	CONCRETE	WHITE	
48	< LOD	< LOD	620	< LOD	< LOD	< LOD	< LOD	< LOD	C005	W	WALL	CMU	WHITE	
49	< LOD	< LOD	884	20	< LOD	< LOD	< LOD	< LOD	C005	E	WALL	CONCRETE	WHITE	
50	< LOD	< LOD	355	< LOD	< LOD	< LOD	23	< LOD	27E	E	WALL	CMU	WHITE	
51	< LOD	< LOD	1,563	< LOD	< LOD	< LOD	< LOD	< LOD	27E	N	WALL	BRICK	WHITE	
52	< LOD	< LOD	416	< LOD	< LOD	< LOD	< LOD	< LOD	C009	S	WALL	CONCRETE	WHITE	
53	< LOD	< LOD	167	< LOD	< LOD	< LOD	< LOD	< LOD	68A	W	WALL	CONCRETE	TAN	
54	< LOD	< LOD	309	< LOD	< LOD	< LOD	< LOD	< LOD	68A	N	WALL	CONCRETE	TAN	
55	< LOD	< LOD	524	< LOD	< LOD	< LOD	< LOD	< LOD	68A	E	WALL	CONCRETE	TAN	
56	< LOD	< LOD	264	< LOD	< LOD	< LOD	< LOD	< LOD	68A	S	WALL	CONCRETE	TAN	
57	< LOD	< LOD	510	< LOD	< LOD	< LOD	< LOD	< LOD	52	W	WALL	CONCRETE	TAN	
59	< LOD	< LOD	823	< LOD	< LOD	< LOD	< LOD	< LOD	52	N	WALL	CONCRETE	TAN	

**TABLE 1**  
**RCRA METALS TEST DATA RESULTS**  
**UNIVERSITY OF MISSOURI - COLUMBIA**  
**MISSOURI NORTH**

RCRA METAL TEST DATA											LOCATION			
TEST NUMBER	Ag	As	Ba	Cd	Cr	Hg	Pb	Se	Room Number	Wall	Component	Substrate	Paint Color	
60	100	< LOD	920	23	< LOD	< LOD	< LOD	< LOD	52	E	WALL	CONCRETE	TAN	
61	< LOD	< LOD	118	58	< LOD	< LOD	< LOD	< LOD	52	S	WALL	CONCRETE	TAN	
62	< LOD	< LOD	525	< LOD	< LOD	< LOD	< LOD	< LOD	45	N	WALL	CMU	TAN	
63	< LOD	< LOD	320	< LOD	< LOD	< LOD	< LOD	< LOD	45	E	WALL	CMU	TAN	
64	< LOD	< LOD	328	< LOD	< LOD	< LOD	< LOD	< LOD	45	W	WALL	CMU	TAN	
65	< LOD	< LOD	374	< LOD	< LOD	< LOD	< LOD	< LOD	C007	W	WALL	CMU	TAN	
66	< LOD	< LOD	677	< LOD	< LOD	< LOD	< LOD	< LOD	40A	N	WALL	CMU	TAN	
67	< LOD	< LOD	388	< LOD	< LOD	< LOD	< LOD	< LOD	40	E	WALL	CMU	TAN	
68	< LOD	< LOD	668	< LOD	< LOD	< LOD	< LOD	< LOD	40	E	COLUMN	CONCRETE	WHITE	
69	< LOD	< LOD	468	< LOD	< LOD	< LOD	< LOD	< LOD	40	W	WALL	CMU	TAN	
70	< LOD	< LOD	469	< LOD	< LOD	< LOD	< LOD	< LOD	C008	W	WALL	CMU	TAN	
71	< LOD	< LOD	416	< LOD	< LOD	< LOD	< LOD	< LOD	C008	S	WALL	CMU	TAN	
72	< LOD	13	406	< LOD	< LOD	< LOD	< LOD	< LOD	C033	E	WALL	CMU	TAN	
73	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	C033	S	WALL	CMU	TAN	
74	129	< LOD	1,068	< LOD	< LOD	< LOD	< LOD	< LOD	34G	S	WALL	CONCRETE	WHITE	
75	125	< LOD	1,077	26	< LOD	< LOD	< LOD	< LOD	32D	S	WALL	CONCRETE	LT. BLUE	
76	< LOD	< LOD	422	< LOD	< LOD	< LOD	< LOD	< LOD	32E	E	WALL	CMU	WHITE	
77	125	< LOD	1,032	39	< LOD	< LOD	< LOD	< LOD	32E	S	WALL	CONCRETE	WHITE	
78	< LOD	< LOD	772	< LOD	< LOD	< LOD	< LOD	< LOD	32B	W	WALL	CONCRETE	WHITE	
79	< LOD	< LOD	1,028	< LOD	< LOD	< LOD	< LOD	< LOD	32B	S	WALL	CONCRETE	WHITE	
80	< LOD	< LOD	691	< LOD	< LOD	< LOD	19	< LOD	19	W	WALL	BRICK	WHITE	
81	< LOD	< LOD	758	< LOD	< LOD	< LOD	< LOD	< LOD	19	E	WALL	BRICK	WHITE	
82	< LOD	< LOD	744	20	< LOD	< LOD	< LOD	< LOD	19	N	COLUMN	CONCRETE	WHITE	
83	< LOD	< LOD	854	< LOD	< LOD	< LOD	< LOD	< LOD	19	S	WALL	CONCRETE	WHITE	

**TABLE 1**  
**RCRA METALS TEST DATA RESULTS**  
**UNIVERSITY OF MISSOURI - COLUMBIA**  
**MISSOURI NORTH**

RCRA METAL TEST DATA											LOCATION			
TEST NUMBER	Ag	As	Ba	Cd	Cr	Hg	Pb	Se	Room Number	Wall	Component	Substrate	Paint Color	
84	< LOD	< LOD	143	< LOD	< LOD	< LOD	< LOD	< LOD	19	-	CEILING	CONCRETE	WHITE	
85	< LOD	19	727	< LOD	< LOD	< LOD	< LOD	< LOD	19	N	WALL	BRICK	WHITE	
86	< LOD	< LOD	815	< LOD	< LOD	< LOD	< LOD	< LOD	3	N	WALL	BRICK	WHITE	
87	< LOD	< LOD	2,214	< LOD	< LOD	73	138	< LOD	1	W	WALL	BRICK	WHITE/BLUE SPECKS	
88	< LOD	< LOD	771	< LOD	< LOD	< LOD	< LOD	< LOD	1	N	WALL	CMU	WHITE/BLUE SPECKS	
89	< LOD	< LOD	1,042	< LOD	< LOD	< LOD	< LOD	< LOD	1	W	WALL	CMU	WHITE/BLUE SPECKS	
90	< LOD	< LOD	808	20	< LOD	< LOD	< LOD	< LOD	1	S	WALL	CMU	WHITE/BLUE SPECKS	
91	< LOD	< LOD	4,807	28	< LOD	< LOD	3,117	< LOD	1	W	COLUMN	CONCRETE	WHITE/BLUE SPECKS	
92	< LOD	< LOD	4,853	< LOD	< LOD	< LOD	1,634	< LOD	1	S	COLUMN	CONCRETE	WHITE/BLUE SPECKS	
93	< LOD	< LOD	438	< LOD	< LOD	< LOD	< LOD	< LOD	STAIRWELL A - GROUND	W	WALL	CMU	WHITE	
94	< LOD	< LOD	340	< LOD	< LOD	< LOD	< LOD	< LOD	STAIRWELL A - GROUND	S	WALL	CMU	WHITE	
95	< LOD	10	469	< LOD	< LOD	< LOD	< LOD	< LOD	STAIRWELL A - GROUND	N	WALL	CMU	WHITE	
96	< LOD	< LOD	320	< LOD	< LOD	< LOD	< LOD	< LOD	STAIRWELL A - 1ST FLOOR	S	WALL	CMU	WHITE	
97	< LOD	< LOD	821	20	< LOD	< LOD	< LOD	< LOD	STAIRWELL A - 2ND FLOOR	N	WALL	CONCRETE	WHITE	
98	< LOD	< LOD	451	< LOD	< LOD	< LOD	< LOD	< LOD	STAIRWELL A - 2ND FLOOR	E	WALL	CMU	TAN	
99	< LOD	< LOD	455	< LOD	< LOD	< LOD	< LOD	< LOD	STAIRWELL A - 2ND FLOOR	W	WALL	CMU	TAN	
100	< LOD	< LOD	558	26	< LOD	< LOD	< LOD	< LOD	STAIRWELL B - 3RD FLOOR	W	WALL	CMU	WHITE	
101	< LOD	< LOD	668	< LOD	< LOD	< LOD	< LOD	< LOD	STAIRWELL B - 3RD FLOOR	W	WALL	CMU	WHITE	
102	< LOD	10	428	< LOD	< LOD	< LOD	< LOD	< LOD	STAIRWELL B - 3RD FLOOR	E	WALL	CMU	WHITE	
103	< LOD	10	392	< LOD	< LOD	< LOD	< LOD	< LOD	STAIRWELL B - 3RD FLOOR	S	WALL	CMU	WHITE	
104	< LOD	< LOD	378	< LOD	< LOD	< LOD	< LOD	< LOD	STAIRWELL B - 2ND FLOOR	N	WALL	CMU	WHITE	
105	< LOD	< LOD	549	< LOD	< LOD	< LOD	< LOD	< LOD	STAIRWELL B - 2ND FLOOR	W	WALL	CMU	WHITE	
106	< LOD	< LOD	954	< LOD	< LOD	< LOD	< LOD	< LOD	STAIRWELL B - 1ST FLOOR	S	WALL	CONCRETE	WHITE	

**TABLE 1**  
**RCRA METALS TEST DATA RESULTS**  
**UNIVERSITY OF MISSOURI - COLUMBIA**  
**MISSOURI NORTH**

RCRA METAL TEST DATA											LOCATION			
TEST NUMBER	Ag	As	Ba	Cd	Cr	Hg	Pb	Se	Room Number	Wall	Component	Substrate	Paint Color	
107	< LOD	< LOD	344	< LOD	< LOD	< LOD	< LOD	< LOD	STAIRWELL B - GROUND	N	WALL	CMU	WHITE	
108	< LOD	35	3,742	38	< LOD	< LOD	130	< LOD	28	E	WALL	BRICK	WHITE	
109	<b>101</b>	81	4,149	42	< LOD	< LOD	243	< LOD	<b>28</b>	<b>S</b>	<b>WALL</b>	<b>BRICK</b>	<b>WHITE</b>	
110	< LOD	72	5,559	28	< LOD	< LOD	297	< LOD	28	W	WALL	BRICK	WHITE	
111	< LOD	54	12,173	54	< LOD	< LOD	548	< LOD	28	S	WALL	BRICK	YELLOW	
112	< LOD	< LOD	676	< LOD	< LOD	< LOD	15	< LOD	28	W	WALL	CMU	WHITE	
113	< LOD	< LOD	819	< LOD	< LOD	< LOD	428	< LOD	28	W	WALL	CONCRETE	WHITE	
114	< LOD	29	556	< LOD	< LOD	< LOD	107	< LOD	28	S	WALL	CONCRETE	WHITE	
115	<b>113</b>	<b>91</b>	4,167	25	1,517	< LOD	224	< LOD	<b>28</b>	<b>E</b>	<b>WALL</b>	<b>BRICK</b>	<b>WHITE</b>	
116	< LOD	< LOD	391	< LOD	< LOD	< LOD	< LOD	< LOD	28C	S	WALL	CMU	WHITE	
117	< LOD	< LOD	921	< LOD	< LOD	< LOD	< LOD	< LOD	28C	E	WALL	CONCRETE	WHITE	
118	< LOD	< LOD	416	< LOD	< LOD	< LOD	< LOD	< LOD	28C	N	WALL	CMU	WHITE	
119	< LOD	< LOD	686	< LOD	< LOD	< LOD	< LOD	< LOD	28C	N	WALL	CONCRETE	WHITE	
120	< LOD	22	428	54	< LOD	< LOD	42	< LOD	28	W	WALL	CMU	WHITE	
121	< LOD	45	4,637	30	< LOD	< LOD	272	< LOD	28	W	WALL	BRICK	WHITE	
122	< LOD	< LOD	706	< LOD	< LOD	< LOD	56	< LOD	28	W	WALL	CONCRETE	WHITE	
123	< LOD	30	2,356	27	< LOD	< LOD	43	< LOD	24A	S	WALL	BRICK	PINK	
124	< LOD	< LOD	1,886	< LOD	1,195	< LOD	< LOD	< LOD	23A	S	WALL	BRICK	YELLOW	
125	< LOD	< LOD	2,129	< LOD	1,490	< LOD	< LOD	< LOD	23A	E	WALL	CONCRETE	YELLOW	
126	< LOD	13	3,265	< LOD	563	< LOD	< LOD	< LOD	23A	N	WALL	BRICK	YELLOW	
127	<b>118</b>	< LOD	1,916	34	955	< LOD	< LOD	< LOD	<b>23A</b>	<b>W</b>	<b>COLUMN</b>	<b>CONCRETE</b>	<b>YELLOW</b>	
128	< LOD	< LOD	1,481	< LOD	< LOD	< LOD	< LOD	< LOD	23	N	WALL	BRICK	WHITE	
129	< LOD	< LOD	524	< LOD	< LOD	< LOD	< LOD	< LOD	23	S	WALL	CMU	WHITE	
130	< LOD	< LOD	831	< LOD	< LOD	< LOD	< LOD	< LOD	23	E	WALL	CONCRETE	WHITE	

**TABLE 1**  
**RCRA METALS TEST DATA RESULTS**  
**UNIVERSITY OF MISSOURI - COLUMBIA**  
**MISSOURI NORTH**

RCRA METAL TEST DATA											LOCATION			
TEST NUMBER	Ag	As	Ba	Cd	Cr	Hg	Pb	Se	Room Number	Wall	Component	Substrate	Paint Color	
131	189	< LOD	13,488	76	< LOD	< LOD	2,983	< LOD	24B	S	COLUMN	CONCRETE	GOLD	
132	154	< LOD	8,769	43	< LOD	< LOD	3,489	< LOD	24B	E	COLUMN	CONCRETE	BEIGE	
Calibration	435	451	695	473	582	< LOD	486	511	CALIBRATION					
SYSTEM CHECK											SYSTEM CHECK			
SYSTEM CHECK											SYSTEM CHECK			
MDNR Clean Fill Concentrations	99	87	15,200	429	3,285	100	4,999	50						

**NOTES**

RCRA Metal results that are regarded as elevated are highlighted in yellow, bolded, italicized, and presented in larger print.  
 Test results in this table are presented in parts per million (ppm)  
 System Checks performed and passed before using the device for the day and at the end of the day.  
 <LOD = Data result below limit of detection for the device  
 ND = Non Detect

Ag=Silver; As=Arsenic; Ba=Barium; Cd=Cadmium; Cr=Chromium; Hg=Mercury; Pb= Lead; Se=Selenium  
 MDNR Clean Fill Concentrations = Missouri Department of Natural Resources (MDNR) document "Using Painted Block and Brick as Clean Fill", updated January 31, 2003



## **APPENDIX C**

### **FLOOR PLANS WITH CONFIRMED ASBESTOS CONTAINING MATERIALS LOCATIONS**

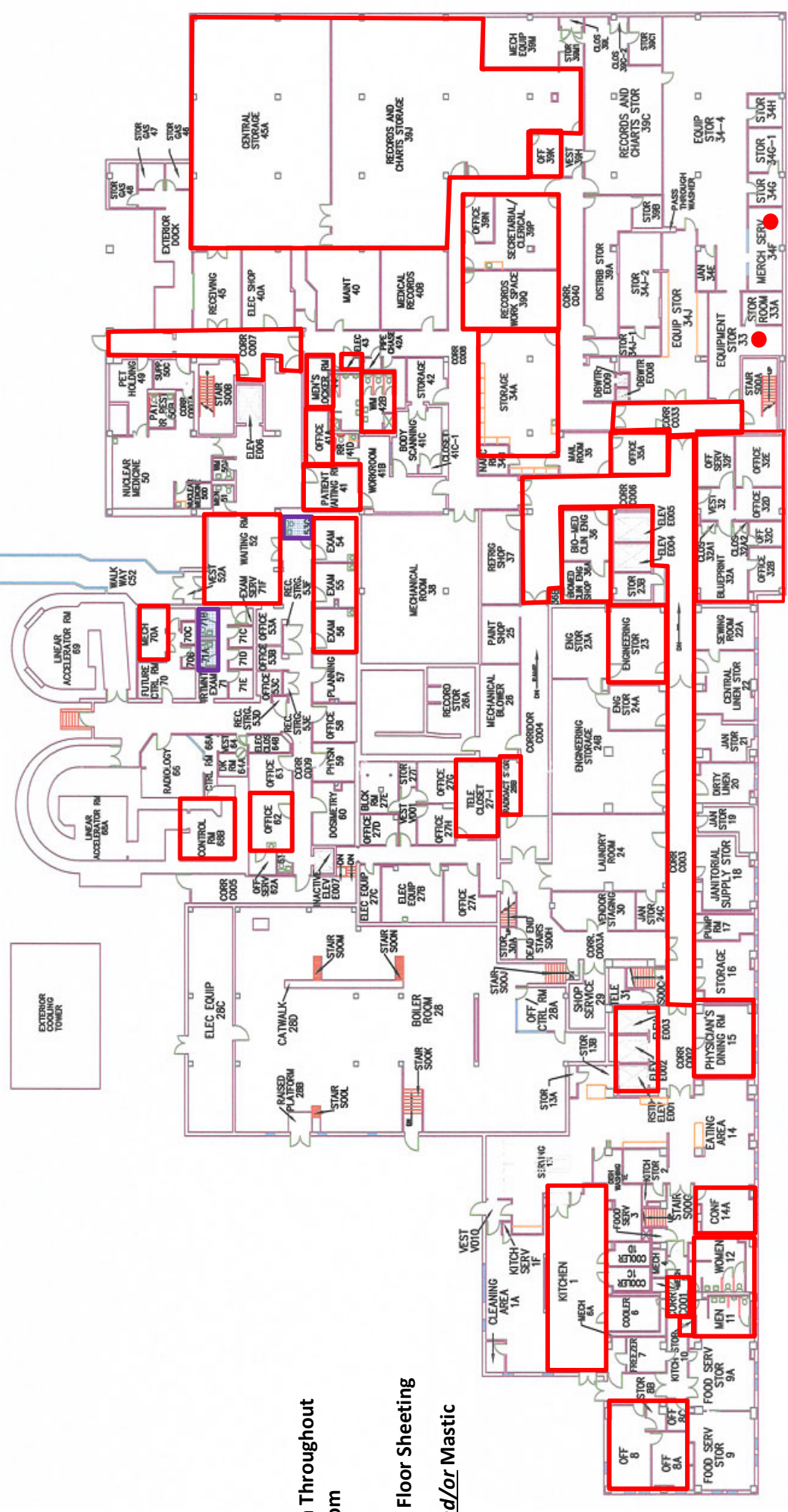




ASSUMED Electrical Wiring Insulation Throughout Stairwells  
 ASSUMED Fire Doors Throughout

- ACM Sink Undercoating
- ACM Mastic under non-ACM Floor Sheeting
- ACM 12" by 12" Floor Tile and/or Mastic

ACM Pipe and Pipe Fitting Insulation Throughout  
 Including Pipe Chases and Boiler Room



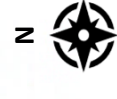
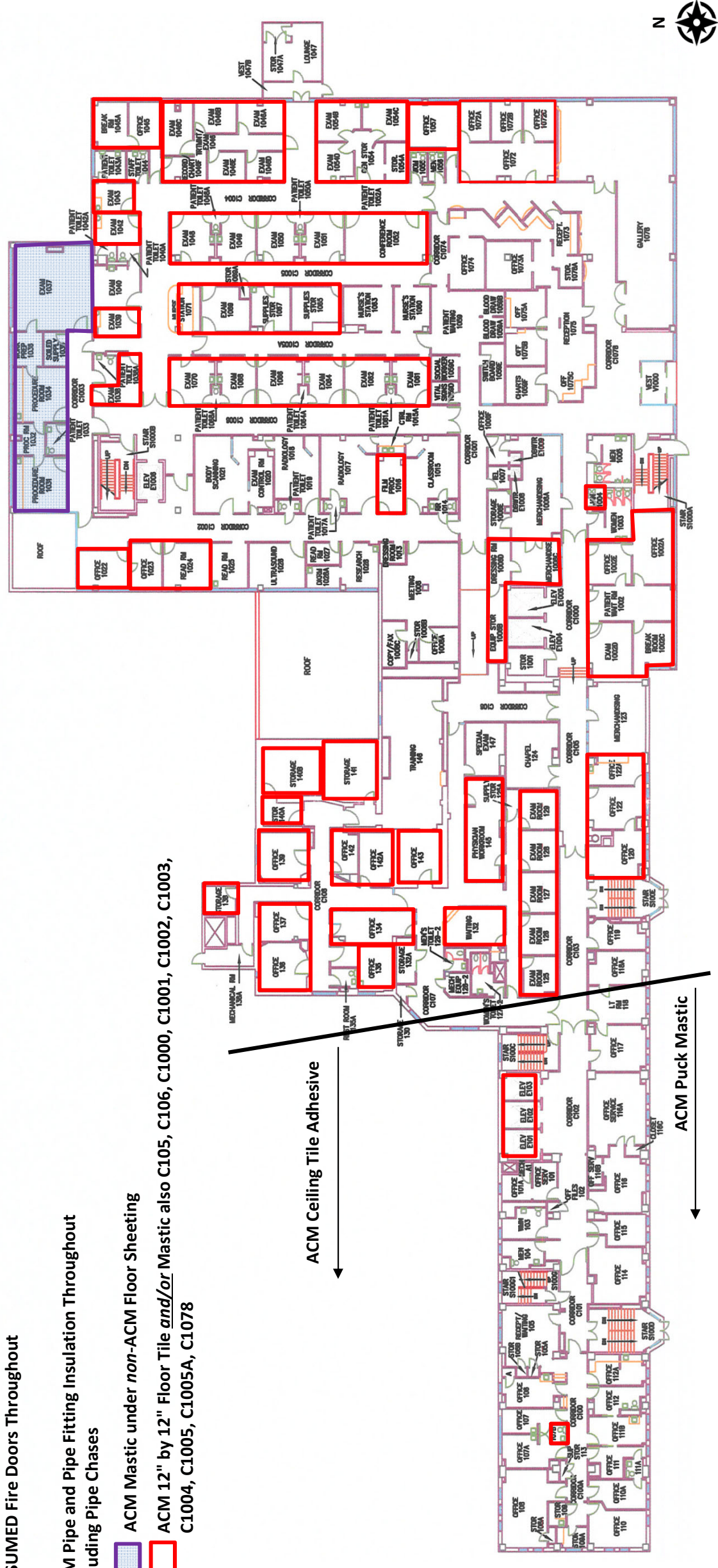
	MU Project Number CP219078 MIZOU NORTH BUILDING GROUND FLOOR 115 Business Loop 70 W, Columbia, Missouri 65211	PSI Project No.: 0029-5291 APPROXIMATE LOCATIONS OF ASBESTOS-CONTAINING MATERIALS Date: March 22, 2022 Drawn, not to scale, by: jcvb
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ASSUMED Electrical Wiring Insulation Throughout Stairwells  
 ASSUMED Fire Doors Throughout

ACM Pipe and Pipe Fitting Insulation Throughout  
 Including Pipe Chases

ACM Mastic under non-ACM Floor Sheeting

ACM 12" by 12" Floor Tile and/or Mastic also C105, C106, C1000, C1001, C1002, C1003, C1004, C1005, C1005A, C1078



MU Project Number CP219078  
 MIZZOU NORTH BUILDING  
 FIRST FLOOR

115 Business Loop 70 W, Columbia, Missouri 65211

PSI Project No.: 0029-5291

APPROXIMATE LOCATIONS OF ASBESTOS-CONTAINING MATERIALS

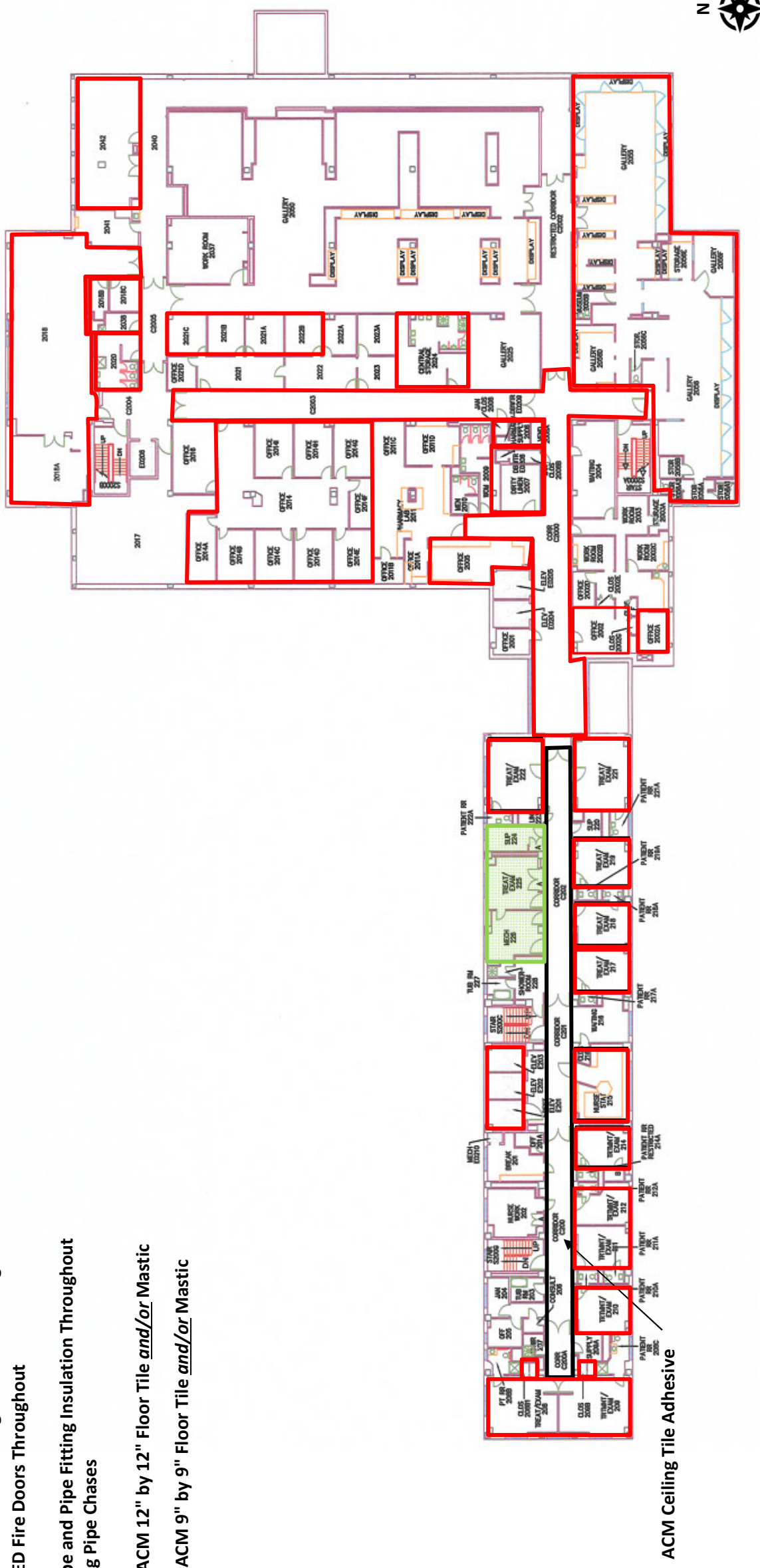
Date: March 22, 2022

Drawn, not to scale, by: jcvb

ASSUMED Electrical Wiring Insulation Throughout Stairwells  
 ASSUMED Fire Doors Throughout

ACM Pipe and Pipe Fitting Insulation Throughout  
 Including Pipe Chases

- ACM 12" by 12" Floor Tile and/or Mastic
- ACM 9" by 9" Floor Tile and/or Mastic



ACM Ceiling Tile Adhesive



MU Project Number CP219078  
 MIZZOU NORTH BUILDING  
 SECOND FLOOR

PSI Project No.: 0029-5291

APPROXIMATE LOCATIONS OF ASBESTOS-CONTAINING MATERIALS

Date: March 22, 2022

Drawn, not to scale, by: jcvb

115 Business Loop 70 W, Columbia, Missouri 65211

ASSUMED Electrical Wiring Insulation Throughout Stairwells

ASSUMED Fire Doors Throughout

▲ ASSUMED Chemical Fume Hoods

■ ASSUMED Countertops

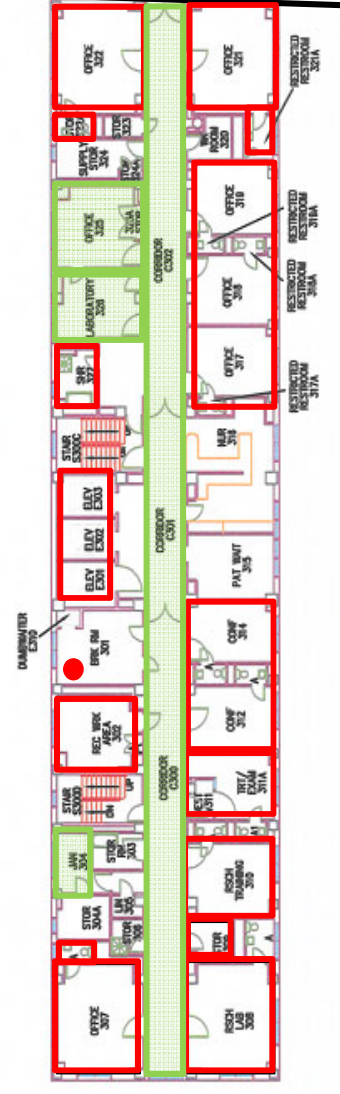
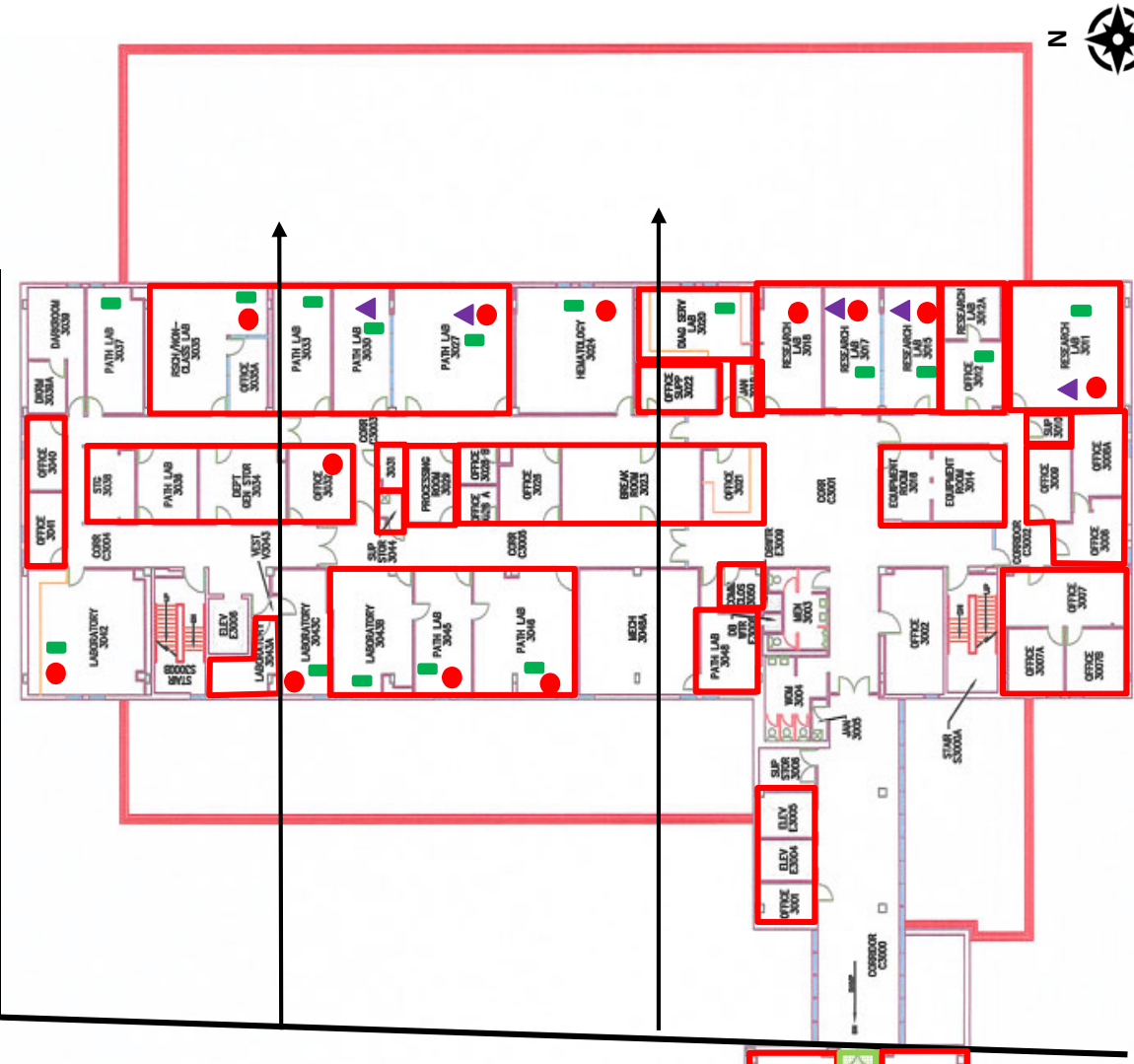
□ ACM 12" by 12" Floor Tile and/or Mastic

● ACM Sink Undercoating

ACM Pipe and Pipe Fitting Insulation Throughout Including Pipe Chases

▨ ACM 9" by 9" Floor Tile and/or Mastic

ACM 12" by 12" Floor Tile and/or Mastic also in Corridors - Throughout this Wing



MU Project Number CP219078  
 MIZZOU NORTH BUILDING  
 THIRD FLOOR

PSI Project No.: 0029-5291  
 APPROXIMATE LOCATIONS OF ASBESTOS-CONTAINING MATERIALS

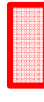
Date: March 22, 2022  
 Drawn, not to scale, by: jcvb

115 Business Loop 70 W, Columbia, Missouri 65211

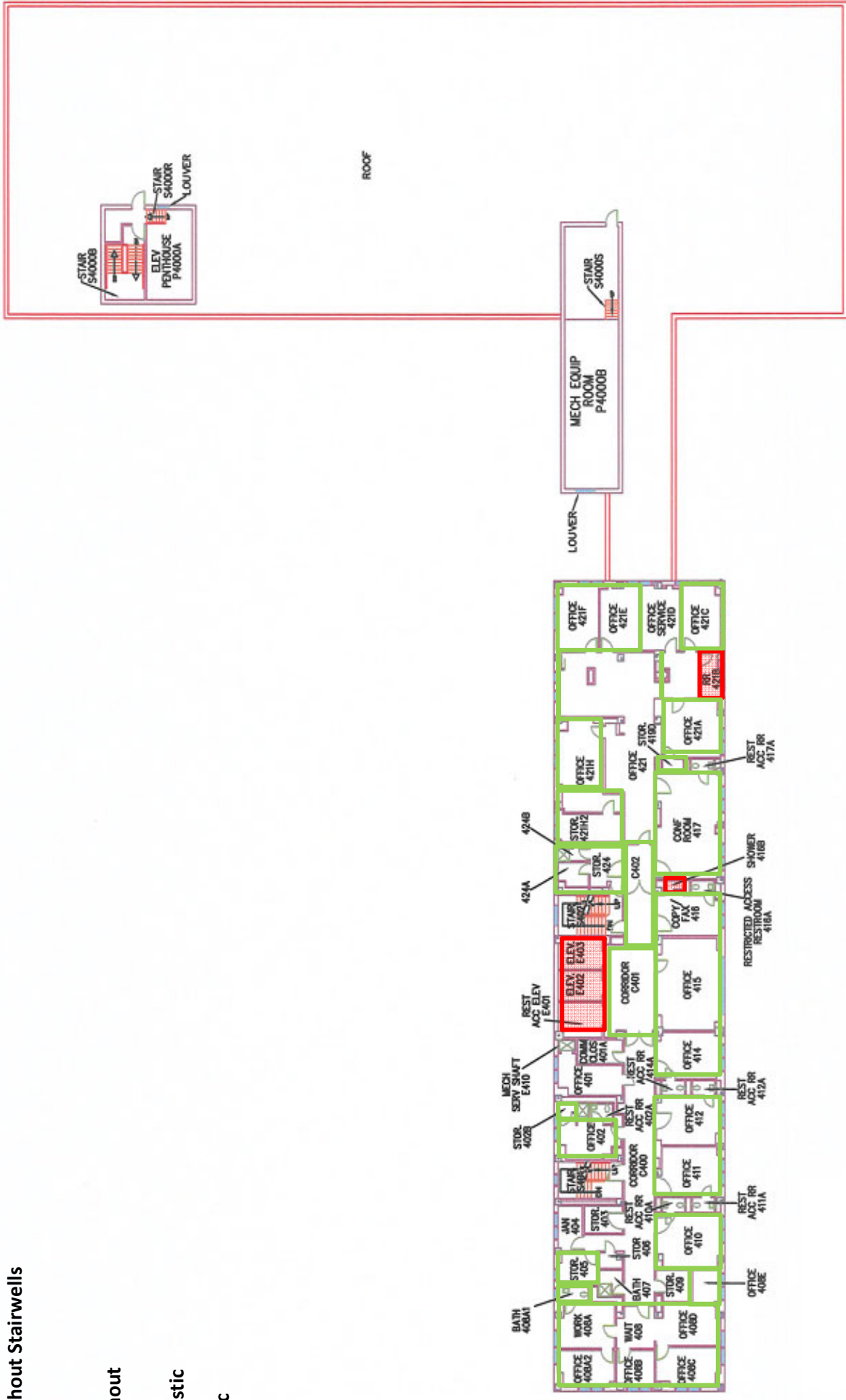
ASSUMED Electrical Wiring Insulation Throughout Stairwells

ASSUMED Fire Doors Throughout

ACM Pipe and Pipe Fitting Insulation Throughout Including Pipe Chases

 ACM 12" by 12" Floor Tile and/or Mastic

 ACM 9" by 9" Floor Tile and/or Mastic



MU Project Number CP219078  
MIZZOU NORTH BUILDING  
FOURTH FLOOR

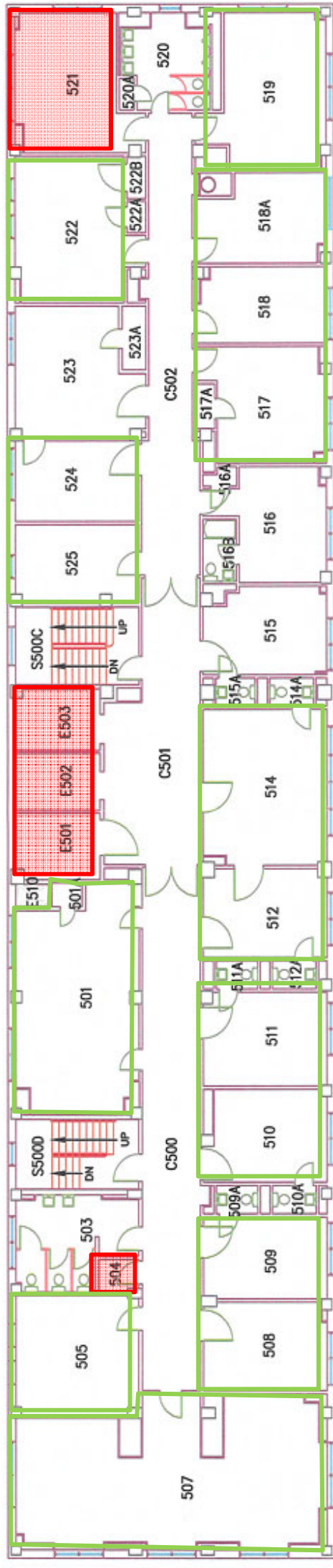
115 Business Loop 70 W, Columbia, Missouri 65211

PSI Project No.: 0029-5291

APPROXIMATE LOCATIONS OF ASBESTOS-CONTAINING MATERIALS

Date: March 22, 2022

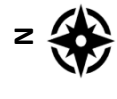
Drawn, not to scale, by: jcvb



- ACM 9" by 9" Floor Tile and/or Mastic
- ACM 12" by 12" Floor Tile and/or Mastic

ACM Pipe and Pipe Fitting Insulation Throughout Including Pipe Chases

ASSUMED Fire Doors Throughout  
 ASSUMED Electrical Wiring Insulation Throughout Stairwells



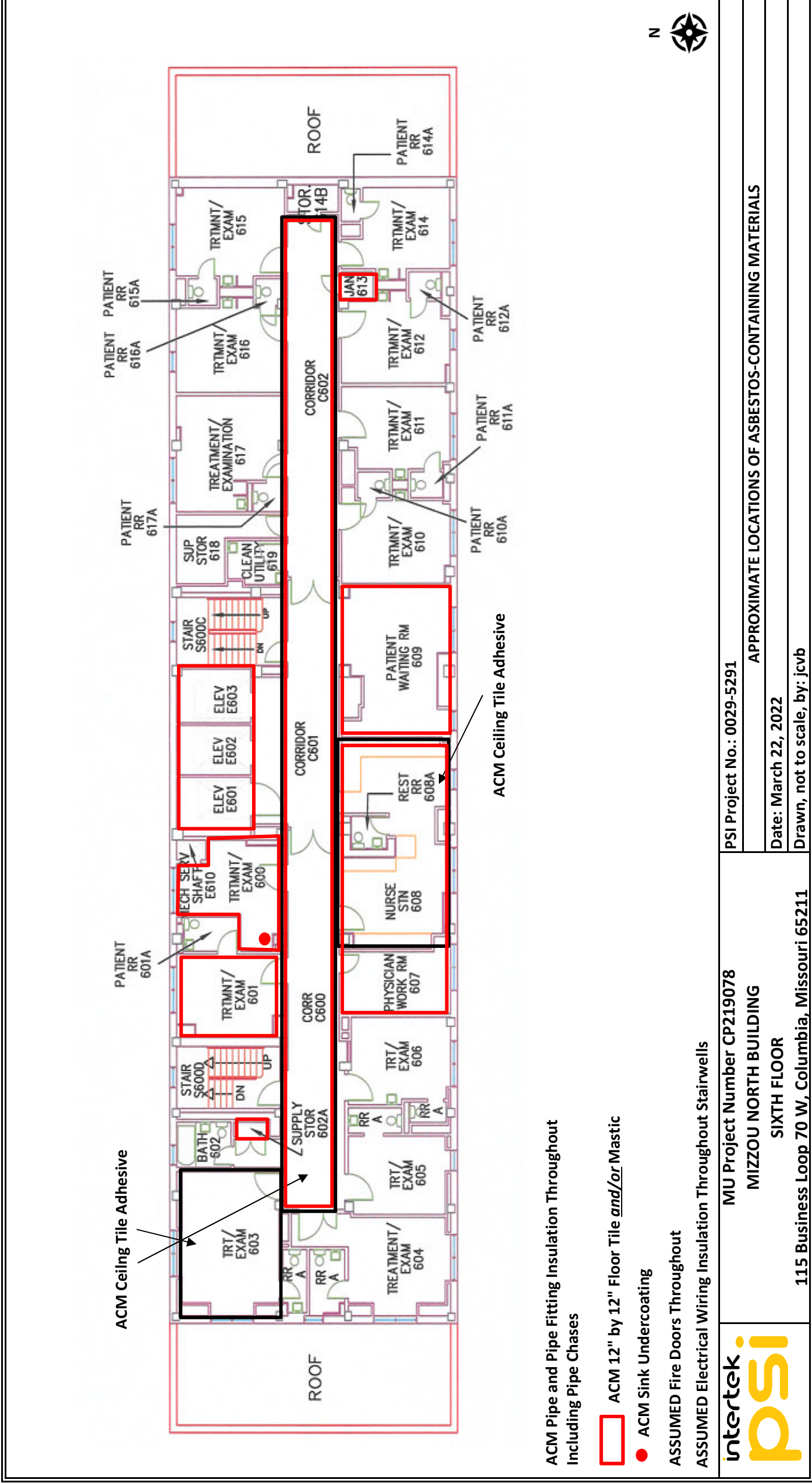
MU Project Number CP219078  
 MIZZOU NORTH BUILDING  
 FIFTH FLOOR  
 115 Business Loop 70 W, Columbia, Missouri 65211

PSI Project No.: 0029-5291

APPROXIMATE LOCATIONS OF ASBESTOS-CONTAINING MATERIALS

Date: March 22, 2022

Drawn, not to scale, by: jcvb



ACM Pipe and Pipe Fitting Insulation Throughout Including Pipe Chases

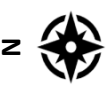
- ACM 12" by 12" Floor Tile *and/or* Mastic
- ACM Sink Undercoating

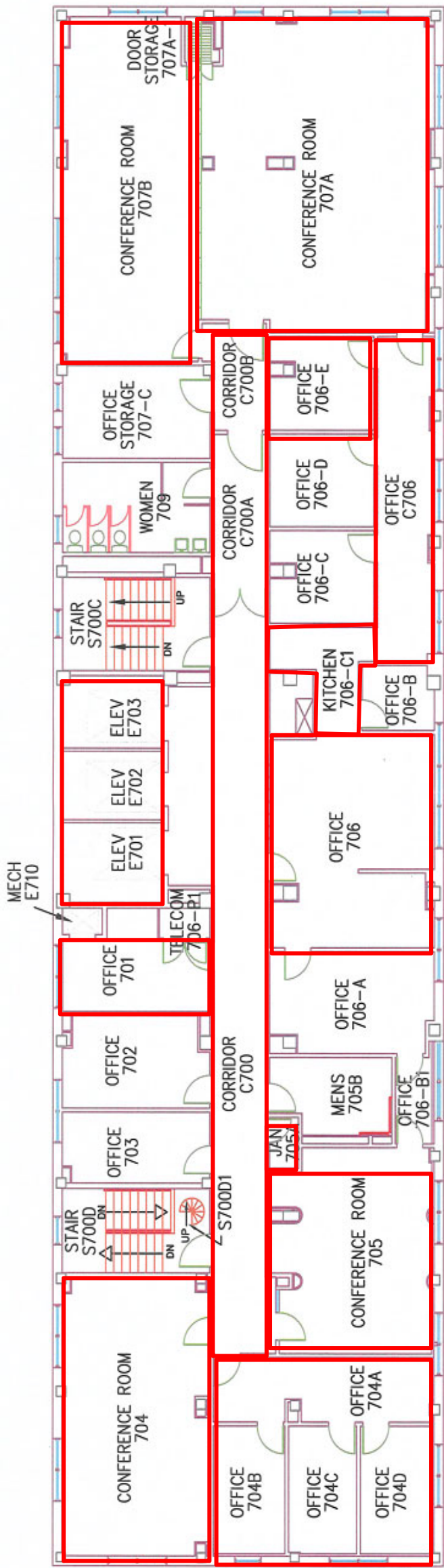
ASSUMED Fire Doors Throughout  
 ASSUMED Electrical Wiring Insulation Throughout Stairwells



MU Project Number CP219078  
 MIZZOU NORTH BUILDING  
 SIXTH FLOOR  
 115 Business Loop 70 W, Columbia, Missouri 65211

PSI Project No.: 0029-5291  
 APPROXIMATE LOCATIONS OF ASBESTOS-CONTAINING MATERIALS  
 Date: March 22, 2022  
 Drawn, not to scale, by: jcvb





ACM 12" by 12" Floor Tile and/or Mastic  
 ACM Pipe and Pipe Fitting Insulation Throughout  
 Including Pipe Chases

ASSUMED Fire Doors Throughout  
 ASSUMED Electrical Wiring Insulation Throughout Stairwells



MU Project Number CP219078  
 MIZZOU NORTH BUILDING  
 SEVENTH FLOOR

PSI Project No.: 0029-5291

APPROXIMATE LOCATIONS OF ASBESTOS-CONTAINING MATERIALS

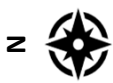
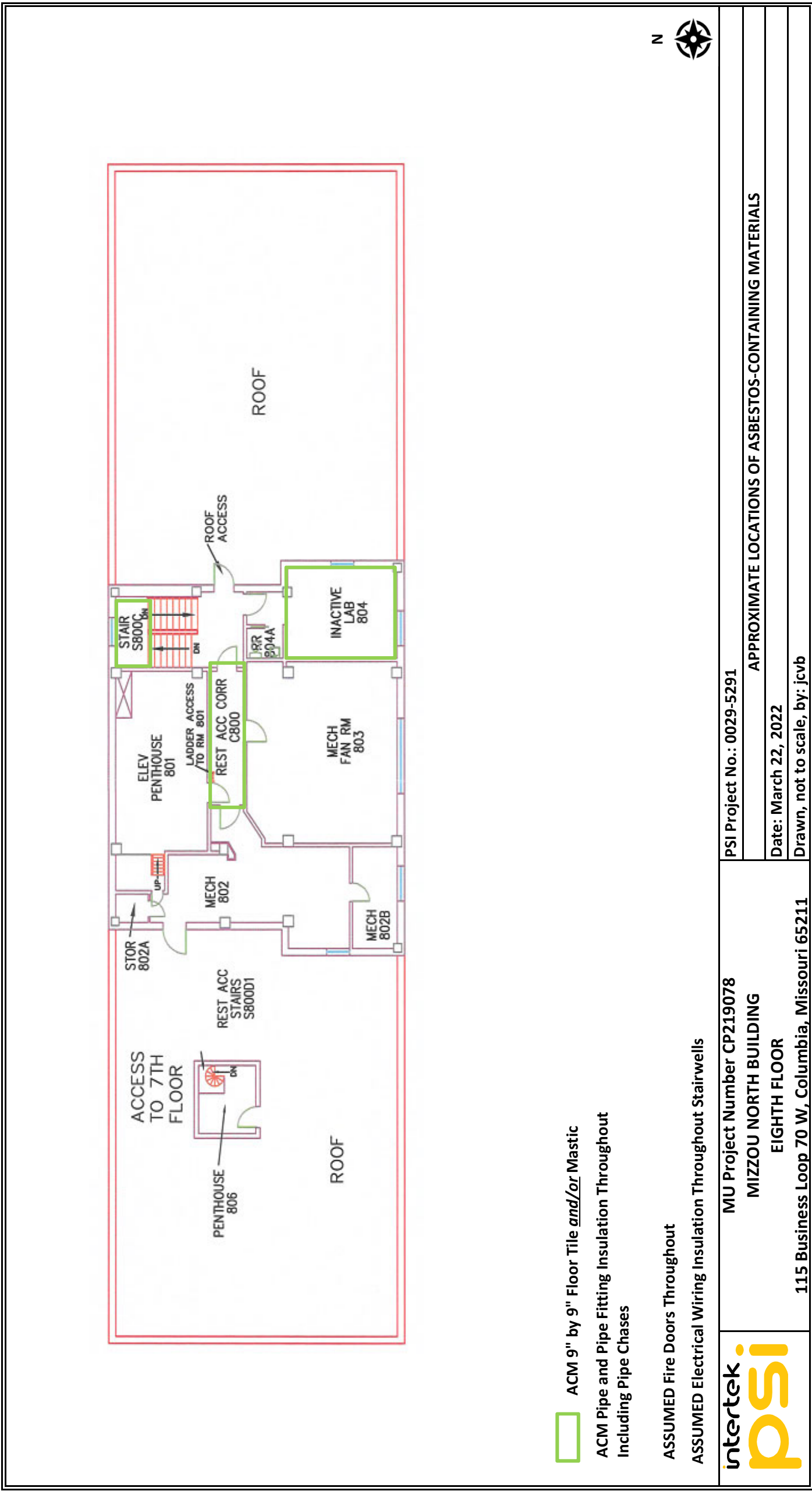
Date: March 22, 2022

Drawn, not to scale, by: jcvb

115 Business Loop 70 W, Columbia, Missouri 65211







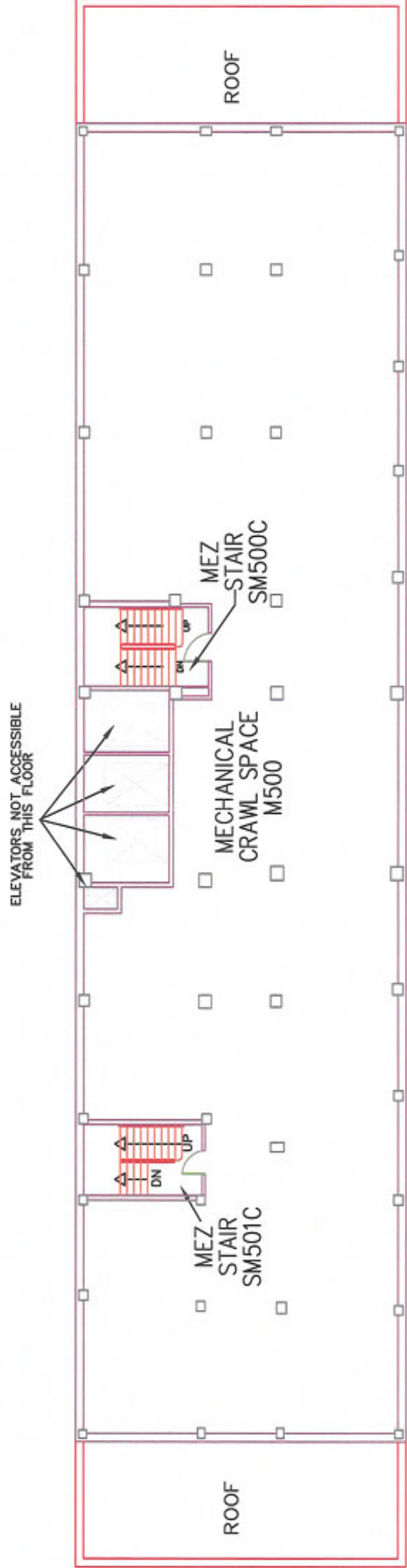
ACM 9" by 9" Floor Tile *and/or* Mastic  
 ACM Pipe and Pipe Fitting Insulation Throughout  
 Including Pipe Chases

ASSUMED Fire Doors Throughout  
 ASSUMED Electrical Wiring Insulation Throughout Stairwells




MU Project Number CP219078  
 MIZZOU NORTH BUILDING  
 EIGHTH FLOOR  
 115 Business Loop 70 W, Columbia, Missouri 65211

PSI Project No.: 0029-5291  
 APPROXIMATE LOCATIONS OF ASBESTOS-CONTAINING MATERIALS  
 Date: March 22, 2022  
 Drawn, not to scale, by: jcvb



ASSUMED Fire Doors Throughout  
 ASSUMED Electrical Wiring Insulation Throughout Stairwells

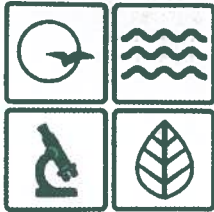


	MU Project Number CP219078 MIZZOU NORTH BUILDING MEZZANINE 115 Business Loop 70 W, Columbia, Missouri 65211	PSI Project No.: 0029-5291
	APPROXIMATE LOCATIONS OF ASBESTOS-CONTAINING MATERIALS	
	Date: March 22, 2022 Drawn, not to scale, by: jcvb	



## **APPENDIX D**

### **PERSONNEL/LABORATORY ACCREDITATIONS**



Missouri Department of dnr.mo.gov

# NATURAL RESOURCES

Michael L. Parson, Governor

August 13, 2021

Matthew E Basch  
10822 Lawnbrook Dr  
St Louis, MO 63123

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: 7118080621MOIR12911  
Course Training Date: August 06, 2021  
Missouri Certification Approval Date: August 13, 2021  
Missouri Certification Expiration Date: August 13, 2022

**Note:**

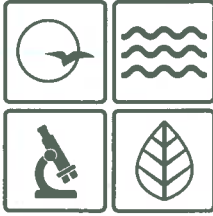
- All Missouri-certified asbestos personnel must comply with the following statutes and regulations:
  - Sections 643.225 to 643.250, RSMo;
  - 10 CSR 10-6.241 *Asbestos Projects-Registration, Abatement, Notification, Inspection, Demolition, and Performance Requirements; and*
  - 10 CSR 10-6.250 *Asbestos 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 dnr.mo.gov

# NATURAL RESOURCES

Michael L. Parson, Governor

January 10, 2022

Austin T Green  
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 Missouri Department of Natural Resources' Air Pollution Control Program.

Missouri Certification Number: 7118010522MOII21989  
Course Training Date: January 05, 2022  
Missouri Certification Approval Date: January 11, 2022  
Missouri Certification Expiration Date: January 11, 2023

### 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:*

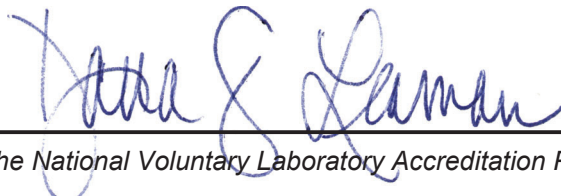
**Asbestos Fiber Analysis**

*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).*

2021-07-01 through 2022-06-30

*Effective Dates*



  
*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](mailto: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

August 10, 2022

Ms. Pamela Eugster, R.A.  
Campus Facilities – Planning, Design & Construction  
University of Missouri  
E111 General Services Building  
Columbia, Missouri 65211

ATTN: Ms. Pamela Eugster, R.A.  
Email: [eugsterpj@missouri.edu](mailto:eugsterpj@missouri.edu)

RE: **Report for Hazardous Materials Survey**  
*Mizzou North Block Storage Building Demolition*  
*MU Project Number CP219078*  
115 Business Loop 70 W  
Columbia, Missouri 65211  
**PSI Project Number: 0029-5291-3**

Dear Ms. Eugster:

In accordance with our agreement, Professional Service Industries, Inc., (PSI), an Intertek company, has conducted a Hazardous Materials Survey for the ground floor of the University Physicians Medical Building located at 1020 Hitt Street in Columbia, Missouri. 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 SURVEY AND UNIVERSAL  
WASTE VISUAL ASSESSMENT  
REPORT**

*For*

**MIZZOU NORTH BLOCK STORAGE  
BUILDING DEMOLITION**

**MU PROJECT NUMBER: CP219078  
115 Business Loop 70 W  
Columbia, Missouri 65211**

*Prepared for*

**Campus Facilities  
University of Missouri  
E111 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: 0029-5291-3**

**August 10, 2022**



A handwritten signature in blue ink that reads "Megan Kienker".

---

Megan Kienker  
MDNR Asbestos Inspector  
Cert. No.: 7136052722MOI121662

A handwritten signature in blue ink that reads "Kaylin McCoy".

---

Kaylin McCoy  
MDNR Asbestos Inspector  
Cert. No.: 7118052522MOI122200

A handwritten signature in blue ink that reads "Greg Chambliss".

---

Greg Chambliss, RPIH, LEED AP  
Department Manager



## TABLE OF CONTENTS

1.0 INTRODUCTION.....	1
1.1 General Information .....	1
1.2 Authorization .....	1
1.3 Purpose .....	1
2.0 SCOPE OF SERVICES .....	2
2.1 Scope of Work.....	2
2.2 Sampling Guidelines.....	2
3.0 METHODOLOGY .....	3
3.1 General References.....	3
3.2 Visual Inspection .....	3
3.2.1 Homogeneous Material Classifications .....	3
3.3 Sampling Procedures .....	3
3.4 Quantification .....	4
3.5 Laboratory Procedures .....	4
3.5.1 Method of Analysis .....	4
3.5.2 Laboratory Quality Control Program .....	4
3.6 Report Formats .....	5
3.6.1 Report Format for Asbestos Table .....	5
4.0 FINDINGS AND RECOMMENDATIONS .....	6
4.1 Asbestos Survey Summary.....	6
4.2 Asbestos Survey Summary.....	6
4.3 Universal Wastes Survey Summary .....	7
5.0 WARRANTY.....	8
APPENDICES	
APPENDIX A - Asbestos Laboratory Results and Chain of Custody Forms	
APPENDIX B - Personnel/Laboratory Accreditations	
APPENDIX C - Photographs of Confirmed ACM (not applicable)	



## **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 Block Storage Building, northwest of the Mizzou North Building located at 115 Business Loop 70 W in Columbia, Missouri for the MU Project Number CP219078.

The Block Storage Building is an “L” shape building and consists of a metal car port, a workroom space, and a garage.

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. Pamela Eugster of the University of Missouri via University of Missouri General Consulting Agreement, dated January 28, 2022.

PSI was given access and escorted throughout the Block Storage Building by University of Missouri maintenance personnel.

### **1.3 PURPOSE**

The purpose of the survey was to determine the presence of asbestos and universal waste materials, prior to the planned demolition.



## 2.0 SCOPE OF SERVICES

### 2.1 SCOPE OF WORK

As part of this project, the following services were performed:

- Asbestos Survey and Sampling
- Evaluation for the presence of the following environmental concerns included but was not limited to:
  - Fluorescent Light Tubes
  - Fire Extinguishers
  - A/C Units
  - Refrigerators

### 2.2 SAMPLING GUIDELINES

The survey of the Block Storage 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 building was conducted in accordance with general EPA/AHERA sampling guidelines to determine the presence of suspect asbestos-containing materials (ACM). Ms. Megan Kienker and Ms. Kaylin McCoy, State of Missouri, and EPA accredited asbestos inspectors, performed the asbestos survey.

Samples of suspect asbestos-containing materials were collected from representative areas of the building, which could be physically entered during the survey.

Samples were sent to EMSL's laboratory located in St. Louis, Missouri, 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.

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 the Block Storage Building 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.



PSI was given access and escorted throughout the Block Storage Building 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**

EMSL'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.



### 3.6 REPORT FORMATS

#### 3.6.1 Report Format for Asbestos Survey Summary Table

##### Sample Numbers

An alpha numeric number is assigned to each sample to track results. A homogenous area is defined as an area of material that is uniform in color, texture, and age. Each homogenous area was given a distinct letter designation. An example of the numbering sequence is as follows:

##### MN-DW-A-1

MN = Represents associated project for the sampling (Mizzou North)

DW = Type of material sampled (i.e., Drywall)

A = Homogeneous Area 'A'

1 = First sample taken from homogeneous area A

##### Description

Describes the material.

##### General Location

Area in the building where suspect material was found.

##### Asbestos % and Type

Amount and type of asbestos (Any material containing more than 1% asbestos is considered an ACM) or if the material does not contain asbestos (ND = None Detected).

##### F/NF

Whether the material is friable (can be reduced to powder by hand pressure) or non-friable.

##### Condition

Assessment on whether the material is in good condition, fair condition, or poor condition.

##### Estimated Quantity

Approximate quantity of confirmed ACM, broken down by location.

##### Abbreviations

SF = Square Feet

LF = Linear Feet

EA = Each



## 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.

PSI performed the asbestos survey of the Block Storage Building on July 19, 2022. The following table includes the results of the survey.

Sample Numbers	Description	General Location	Asbestos, % and type	F/NF	Condition	Estimated Quantity
MN-DW-A-1, 2, 3	(1) Drywall (2) Tape (3) Joint Compound	Small Workroom	(1) ND, ND, ND (2) ND, ND, ND (3) ND, ND, ND	NF F F	Good	NA
MN-WG-B-1, 2, 3	Window Glazing	Garage	ND, ND, ND	F	Good	NA
MN-WG-C-1, 2, 3	Window Glazing	Interior Windows	ND, ND, ND	F	Good	NA
MN-DC-D-1, 2, 3	Door Caulk	Exterior Door	ND, ND, ND	F	Good	NA

Materials found to be asbestos-containing are **bolded** and *italicized*.

ND = No Asbestos Detected    NA = Not Applicable    NT = Not Analyzed Due To 1<sup>st</sup> Positive

CH = Chrysotile asbestos    AM = Amosite asbestos

SF = Square Feet    LF = Linear Feet    EA = Each

F – Friable    NF = Non-Friable    \*Material was analyzed by Point Count Method

Based on the results, the materials sampled were found to NOT contain asbestos. The use of a State of Missouri licensed asbestos abatement contractor is not necessary prior to demolition.

### 4.2 UNIVERSAL WASTES SURVEY SUMMARY

The following universal wastes were identified during the survey.

#### Fluorescent Light Tubes

Approximately 31 fluorescent light tubes were noted throughout the building. Fluorescent light tubes may contain small amounts of Mercury and should be disposed of properly.

#### PCB-Containing Light Ballasts

A hand-held electronic meter was used to determine if the lights ballasts observed in the building were electronic or if they contained PCBs. Polychlorinated biphenyls (PCBs) are a known carcinogenic material. Based on the readings of the hand-held meter, PCB-containing light ballasts were not noted in the building.





#### Fire Extinguishers

Approximately 1 fire extinguisher was noted in the building. Fire extinguishers may contain amounts of chlorofluorocarbons (CFCs) and/or Hydrochlorofluorocarbons (HCFCs) and should be disposed of properly.

#### A/C Window Units

Approximately 1 A/C window unit was noted in the building. A/C window units may contain amounts of CFCs and/or HCFCs and should be disposed of properly.

#### Refrigerators

Approximately 1 refrigerator was noted in the building. Refrigerators may contain amounts of CFCs and/or HCFCs and should be disposed of properly.

### **4.3 ADDITIONAL CONSIDERATIONS**

If other materials are discovered during demolition 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**



# EMSL Analytical, Inc.

100 Green Park Industrial Court Saint Louis, MO 63123

Tel/Fax: (314) 577-0150 / (314) 776-3313

<http://www.EMSL.com> / [saintlouislab@emsl.com](mailto:saintlouislab@emsl.com)

EMSL Order: 392207468

Customer ID: PSI54

Customer PO: 0029-5291-3

Project ID:

**Attention:** Greg Chambliss  
PSI - Professional Service Industries  
11826 Borman Drive  
Saint Louis, MO 63146

**Phone:** (314) 565-1555

**Fax:** (314) 432-5119

**Received Date:** 07/20/2022 12:00 PM

**Analysis Date:** 07/20/2022

**Collected Date:**

**Project:** 0029-5291-3 Mizzou North - Block Storage Bldg.

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

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
MN-DW-A-1-Joint Compound		White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
392207468-0001					
MN-DW-A-1-Tape		Yellow Fibrous Homogeneous	16% Synthetic 76% Glass	8% Non-fibrous (Other)	None Detected
392207468-0001A					
MN-DW-A-1-Joint Compound		White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
392207468-0001B					
MN-DW-A-1-Drywall		White Non-Fibrous Homogeneous	16% Glass	84% Non-fibrous (Other)	None Detected
392207468-0001C					
MN-DW-A-2-Joint Compound		White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
392207468-0002					
MN-DW-A-2-Tape		Yellow Fibrous Homogeneous	17% Synthetic 67% Glass	16% Non-fibrous (Other)	None Detected
392207468-0002A					
MN-DW-A-2-Joint Compound		White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
392207468-0002B					
MN-DW-A-2-Drywall		White Non-Fibrous Homogeneous	17% Glass	83% Non-fibrous (Other)	None Detected
392207468-0002C					
MN-DW-A-3-Joint Compound		White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
392207468-0003					
MN-DW-A-3-Tape		Yellow Fibrous Homogeneous	100% Glass		None Detected
392207468-0003A					
MN-DW-A-3-Joint Compound		White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
392207468-0003B					
MN-DW-A-3-Drywall		Gray Non-Fibrous Homogeneous	15% Cellulose 10% Glass	75% Non-fibrous (Other)	None Detected
392207468-0003C					
MN-WG-B-1		White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
392207468-0004					
MN-WG-B-2		White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
392207468-0005					

Initial report from: 07/21/2022 09:55:49



# EMSL Analytical, Inc.

100 Green Park Industrial Court Saint Louis, MO 63123

Tel/Fax: (314) 577-0150 / (314) 776-3313


<http://www.EMSL.com> / [saintlouislab@emsl.com](mailto:saintlouislab@emsl.com)

**EMSL Order:** 392207468  
**Customer ID:** PSI54  
**Customer PO:** 0029-5291-3  
**Project ID:**

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

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
MN-WG-B-3 <small>392207468-0006</small>		White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
MN-WG-C-1 <small>392207468-0007</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
MN-WG-C-2 <small>392207468-0008</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
MN-WG-C-3 <small>392207468-0009</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
MN-DC-D-1 <small>392207468-0010</small>		White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
MN-DC-D-2 <small>392207468-0011</small>		White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
MN-DC-D-3 <small>392207468-0012</small>		White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Analyst(s) \_\_\_\_\_  
Eric Loomis (7)  
Sue Ferrario (14)

  
\_\_\_\_\_  
Jeff Siria, Laboratory Manager  
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc. Saint Louis, MO NVLAP Lab Code 200742-0

Initial report from: 07/21/2022 09:55:49





## **APPENDIX B**

### **PERSONNEL/LABORATORY ACCREDITATIONS**



**MISSOURI**  
DEPARTMENT OF  
NATURAL RESOURCES

Michael L. Parson  
Governor

Dru Buntin  
Director

May 31, 2022

Megan Kienker  
11826 Borman Dr.  
St Louis, MO 63132

CERTIFICATION NUMBER:  
**7136052722MOII21662**


THIS CERTIFIES  
**Megan Kienker**  
HAS COMPLETED THE CERTIFICATION  
REQUIREMENTS FOR  
**Inspector**



APPROVED: **05/31/2022**

TRAINING DATE: **05/27/2022**

EXPIRES: **05/31/2023**

  
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: 7136052722MOII21662

Course Training Date: May 27, 2022

Missouri Certification Approval Date: May 31, 2022

Missouri Certification Expiration Date: May 31, 2023

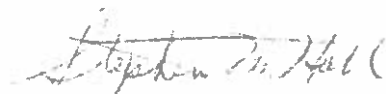
**Note:**

- 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**

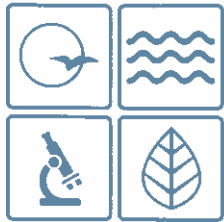


Director of Air Pollution Control Program

PO Box 176, Jefferson City, MO 65102-0176 • [dnr.mo.gov](http://dnr.mo.gov)







**MISSOURI**  
DEPARTMENT OF  
NATURAL RESOURCES

Michael L. Parson  
Governor

Dru Buntin  
Director

May 26, 2022

Kaylin McCoy  
1289 Beamer Ln.  
Cuba, MO 65453



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: 7118052522MOII22200  
Course Training Date: May 25, 2022  
Missouri Certification Approval Date: May 26, 2022  
Missouri Certification Expiration Date: May 26, 2023

**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

PO Box 176, Jefferson City, MO 65102-0176 • [dnr.mo.gov](http://dnr.mo.gov)



United States Department of Commerce  
National Institute of Standards and Technology



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# Certificate of Accreditation to ISO/IEC 17025:2017

---

NVLAP LAB CODE: 200742-0

**EMSL Analytical, Inc.**  
St. Louis, MO

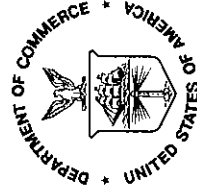
is accredited by the National Voluntary Laboratory Accreditation Program for specific services,  
listed on the Scope of Accreditation, for:

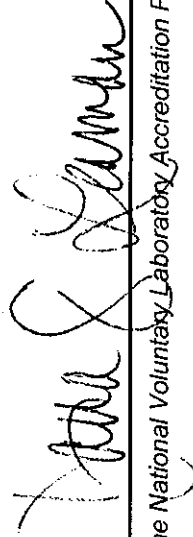
## **Asbestos Fiber Analysis**

*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).*

2022-04-01 through 2023-03-31

Effective Dates



  
For the National Voluntary Laboratory Accreditation Program

**SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017**

**EMSL Analytical, Inc.**  
100 Green Park Industrial Court  
St. Louis, MO 63123  
Dr. Jeff Siria Ph.D  
Phone: 314-577-0150 Fax: 314-776-3313  
Email: jsiria@emsl.com  
http://www.emsl.com

**ASBESTOS FIBER ANALYSIS**

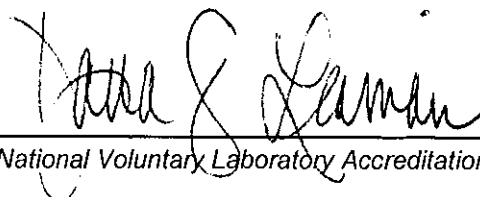
**NVLAP LAB CODE 200742-0**

**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



## **APPENDIX C**

**PHOTOGRAPHS OF CONFIRMED ACM  
(not applicable)**

January 27, 2017

Missouri Department of Natural Resources  
Hazardous Waste Program/Tanks Section  
Attn: Teresa Bullock  
PO Box 176  
Jefferson City, MO 65102

RE: Closure Report for Site ST0008099 (Mizzou North)

Dear Ms. Bullock:

Please find enclosed the University of Missouri's In-Place Closure Report for two (2), 15,000-gallon diesel underground storage tanks located at our Mizzou North Facility, formerly known as the Ellis Fischel Cancer Center, in Columbia, Missouri (ST0008099).

If you have any questions, you may contact me at 573-884-1926 or by email at [mckanee@missouri.edu](mailto:mckanee@missouri.edu).

Sincerely,



Ed McKane  
Environmental Compliance Professional

Encl.

Cc: Doug Spellman; Larry Schilke; Ed Drane

---

**IN-PLACE CLOSURE REPORT  
MIZZOU NORTH, COLUMBIA, MISSOURI  
ST0008099  
FORMERLY KNOWN AS ELLIS FISCHER  
CANCER CENTER**

**JANUARY 2017**

**Prepared by:**

**SCHREIBER, YONLEY & ASSOCIATES  
ELLISVILLE, MISSOURI**

**Prepared for:**

**UNIVERSITY OF MISSOURI  
COLUMBIA, MO**

**Project No. 162602.0219**



TABLE OF CONTENTS

1.0 INTRODUCTION.....1  
2.0 IN-PLACE CLOSURE ACTIVITIES .....1  
3.0 VERIFICATION SAMPLING ACTIVITIES .....2  
4.0 ANALYTICAL RESULTS .....2  
5.0 CONCLUSIONS AND RECOMMENDATIONS.....4

TABLES

Table 1 Analytical Results ..... 3

FIGURES

Figure 1 Site Location Diagram  
Figure 2 Sample Location Diagram

APPENDICES

Appendix A Closure Notification  
Appendix B MDNR Closure Report Form  
Appendix C Photographs  
Appendix D Diesel Fuel Manifests  
Appendix E Rinsewater Analytical Results  
Appendix F Rinsewater Manifest  
Appendix G Ready Mix Tickets  
Appendix H Cleanfill and Landfill Ticket  
Appendix I Boring Logs  
Appendix J Laboratory Analytical Reports  
Appendix K Deed Notice

## **1.0 INTRODUCTION**

The University of Missouri (MU) provided a Closure Notice to the Missouri Department of Natural Resources (MDNR) on August 19, 2016, notifying MDNR of their intent to close in-place, two (2), 15,000-gallon diesel underground storage tanks (USTs). See Appendix A for Closure Notification. The two (2) USTs are located at 115 Business Loop 70 W in Columbia, Missouri at the Mizzou North facility, formerly known as the Ellis Fischel Cancer Center (ST0008099). See Figure 1 for a site location map. MU has determined that the USTs are no longer needed to fuel the generators. Previous modifications to the boilers had removed their ability to burn fuel oil.

Due to the USTs close proximity to a chiller cooler pad associated with the Mizzou North building, MU elected to conduct in-place closure of the USTs to prevent potential damage to the chiller cooler pad and chiller coolers. It is anticipated that the UST area will be utilized to house another group of chiller coolers associated with the Mizzou North facility.

MU contracted with Hunt Environmental and Schreiber, Yonley & Associates to conduct the necessary in-place closure activities. The following sections describe the in-place closure activities, verification sampling activities, analytical results, as well as, our conclusions and recommendations. Appendix B contains a completed MDNR Closure Report Form (780-2120), while Appendix C contains photographs documenting the in-place closure activities.

## **2.0 IN-PLACE CLOSURE ACTIVITIES**

Hunt Environmental initiated in-place activities on November 17, 2016, by removing 21,247 gallons of diesel fuel from the two (2) USTs and transporting the material to Miles Fuel, LLC (MOR000553800) for proper management. See Appendix D for manifests.

On November 20, 2016, Hunt Environmental conducted UST and line cleaning activities by entering the USTs, pressure washing the inside of the USTs, and flushing the lines of the USTs. Upon completion of cleaning activities, a sample of the cleaning liquid was collected and sampled to confirm waste liquid was not a hazardous waste. This sample was collected and shipped to Teklab, Inc. in Collinsville, Illinois for analysis of TCLP lead and benzene, as well as ignitability. Laboratory results are presented in Appendix E.

Five hundred (500) gallons of cleaning water was evacuated from the USTs and facilities, and transported to Valicor Environmental Services in St. Louis, Missouri for proper management. See Appendix F for manifest. Please note that Hunt Vac Services mistakenly used a Uniform Hazardous Waste Manifest for this material. This material is a non-hazardous waste and was managed as such at the Valicor facility.

On November 22, approximately 153 cubic yards of flowable concrete was placed into the USTs and the USTs fill and return lines. See Appendix G for Columbia ready mix load tickets. Upon completion of filling the UST, fifteen (15) yards of topsoil was placed atop the USTs to replace the approximately fourteen (14) tons of concrete and soil debris that was removed and sent to the



City of Columbia sanitary landfill to perform compliance closure. See Appendix H for topsoil and landfill tickets.

### **3.0 VERIFICATION SAMPLING ACTIVITIES**

Verification soil samples were collected by Schreiber, Yonley & Associates (SYA) on December 1, 2016 in accordance with MRBCA guidelines for UST in-place closure. Nine (9) probeholes were advanced utilizing a Powerprobe 9500 operated by Geodrill of Waterloo, Illinois. Probeholes were advanced at the locations depicted on Figure 2. Soils were continuously collected, logged, and screened with a photoionization detector (PID) for the presence of volatile organic vapors. Probeholes around the USTs were advanced until native soil was encountered below the previous UST pit excavation. Probeholes ranged between eighteen (18) to twenty-four (24) feet below ground surface (bgs), except in probehole 03 in which probe refusal was encountered at eight (8) feet bgs. Probehole 09 was advanced in the location of the fill and return lines to a depth of eight (8) feet bgs. Logs of all probeholes were completed and are contained in Appendix I. Boring logs indicate the presence of a brown silty loam to a depth of four (4) feet bgs turning to gravel, which was used in the UST pit, to a depth of nineteen (19) to twenty (20) feet bgs when a native mottled brown, grey silty clay with some sand or pebbles was encountered. No groundwater was encountered in any of the probeholes.

Since no PID readings were noted during the soil screening activities, samples were collected from the native soil beneath the previous tank pit excavation. Samples were properly collected, packed, and transported under proper chain-of-custody procedures to ALS Laboratories in Holland, Michigan for analysis of DRO, BTEX, and PAH constituents.

It should be noted that a soil sample was not collected from probehole location PH03, which encountered refusal at a depth of eight (8) feet bgs. Relocation of this probehole was not feasible due to nearby underground utilities and the presence of chiller coolers. Additionally, probehole PH10 was scheduled to be advanced in the area of the UST diesel fill and return lines, however, the presence of electric, natural gas, water, and sewer lines in the area precluded the advancement of this probehole. This information was conveyed to Ms. Theresa Bullock of the MDNR Closure, Release, and Investigations Unit through a phone call while on-site. It should also be noted that Mr. Daniel Stout of Williams & Company was also on-site during the sample collection activities.

### **4.0 ANALYTICAL RESULTS**

Analytical results for the verification soil samples collected are presented in Table I and are summarized below. Complete laboratory analytical reports are provided in Appendix J.

#### **DRO**

DRO constituent concentrations were not detected above laboratory reporting limits in any sample except PH06 19-20' and PH09 4-5'. DRO was detected in PH06 19-20' at a concentration of 28 mg/kg while PH09 4-5' exhibited a concentration of 110 mg/kg, both of which are well below the MDNR Tier 1 Default Target Level for soil of 4,150 mg/kg.

Table 1  
Analytical Results

Constituent	Tier 1 <sup>1</sup> Default Value (mg/kg)	Sample ID								
		PH01 20-21' (mg/kg)	PH02 20-21' (mg/kg)	PH04 17-18' (mg/kg)	PH05 20-21' (mg/kg)	PH06 19-20' (mg/kg)	PH07 19-20' (mg/kg)	PH08 18-19' (mg/kg)	PH09 4-5' (mg/kg)	
Benzene	0.0561	<0.041	<0.049	<0.045	<0.044	<0.043	<0.042	<0.039	<0.048	
Toluene	29.8	<0.041	<0.049	<0.045	<0.044	<0.043	<0.042	<0.039	<0.048	
Ethylbenzene	39.9	<0.041	<0.049	<0.045	<0.044	<0.043	<0.042	<0.039	<0.048	
Xylenes (Mixed)	24.7	<0.120	<0.150	<0.130	<0.130	<0.130	<0.130	<0.120	<0.140	
Acenaphthene	174	<0.0078	<0.0087	<0.0081	<0.0078	<0.0081	<0.0078	<0.0074	0.033	
Anthracene	3,060	<0.0078	<0.0087	<0.0081	<0.0078	<0.0081	<0.0078	<0.0074	0.049	
Benzo(a)anthracene	6.12	<0.0078	<0.0087	0.045	<0.0078	0.017	<0.0078	0.056	0.096	
Benzo(b)pyrene	0.62	<0.0078	<0.0087	0.044	<0.0078	0.013	<0.0078	0.056	0.079	
Benzo(b)fluoranthene	6.19	<0.0078	<0.0087	0.068	<0.0078	0.023	<0.0078	0.076	0.110	
Benzo(k)fluoranthene	62	<0.0078	<0.0087	0.025	<0.0078	0.011	<0.0078	0.036	0.036	
Chrysene	599	<0.0078	<0.0087	0.032	<0.0078	<0.0081	<0.0078	0.050	0.110	
Dibenzo(a,h)anthracene	0.62	<0.0078	<0.0087	0.018	<0.0078	<0.0081	<0.0078	0.021	0.016	
Fluoranthene	2,280	<0.0078	0.011	0.053	<0.0078	0.019	0.013	0.110	0.170	
Flourene	211	<0.0078	<0.0087	<0.0081	<0.0078	<0.0081	<0.0078	<0.0074	0.065	
Naphthalene	0.325	<0.0078	<0.0087	<0.0081	<0.0078	<0.0081	<0.0078	<0.0074	<0.0081	
Pyrene	1,500	<0.0078	0.016	0.055	<0.0078	0.018	0.015	0.092	0.170	
TPH-DRO	4,150	<5.8	<6.5	<6.1	<5.8	28	<5.9	<5.5	110	

<sup>1</sup> Default Target Soil Level, MRBCA Guidance Document; October 17, 2013

## BTEX

BTEX constituent concentrations were not detected above laboratory reporting limits in any collected sample.

## PAHs

PAH constituent concentrations were not detected above laboratory reporting limits in samples PH01 20-21' and PH05 20-21'. Sample PH02 20-21' exhibited two (2) PAH constituents Fluoranthene and Pyrene, slightly above laboratory reporting limits. Sample PH04 17-18' exhibited eight (8) PAH constituents above laboratory reporting limits with Benzo(b)fluoranthene exhibiting the largest concentration of 0.068 mg/kg. Sample PH06 19-20' exhibited six (6) PAH constituents above laboratory reporting limits, all of which were just slightly above the reporting limit. Sample PH07 19-20' exhibited two (2) PAH constituents concentrations, Fluoranthene and Pyrene, slightly above the laboratory reporting limits. Sample PH08 18-19' exhibited eight (8) PAH constituents concentrations above the laboratory reporting limit, with Fluoranthene exhibiting the highest detection of 0.110 mg/kg. Sample PH09 4-5' exhibited eleven (11) PAH constituents above laboratory reporting limits. Pyrene exhibited the highest concentration of 0.170 mg/kg.

All detected PAH concentrations were well below established MRBCA Tier 1 Default Target Levels for soils.

## **5.0 CONCLUSIONS AND RECOMMENDATIONS**

MU and SYA have successfully completed in-place closure activities of two (2), 15,000-gallon diesel tanks located at the Mizzou North facility, formerly known as the Ellis Fischel Cancer Center. In-place closure activities were conducted following procedures as specified in MDNRs MRBCA Guidance Document dated October 17, 2013.

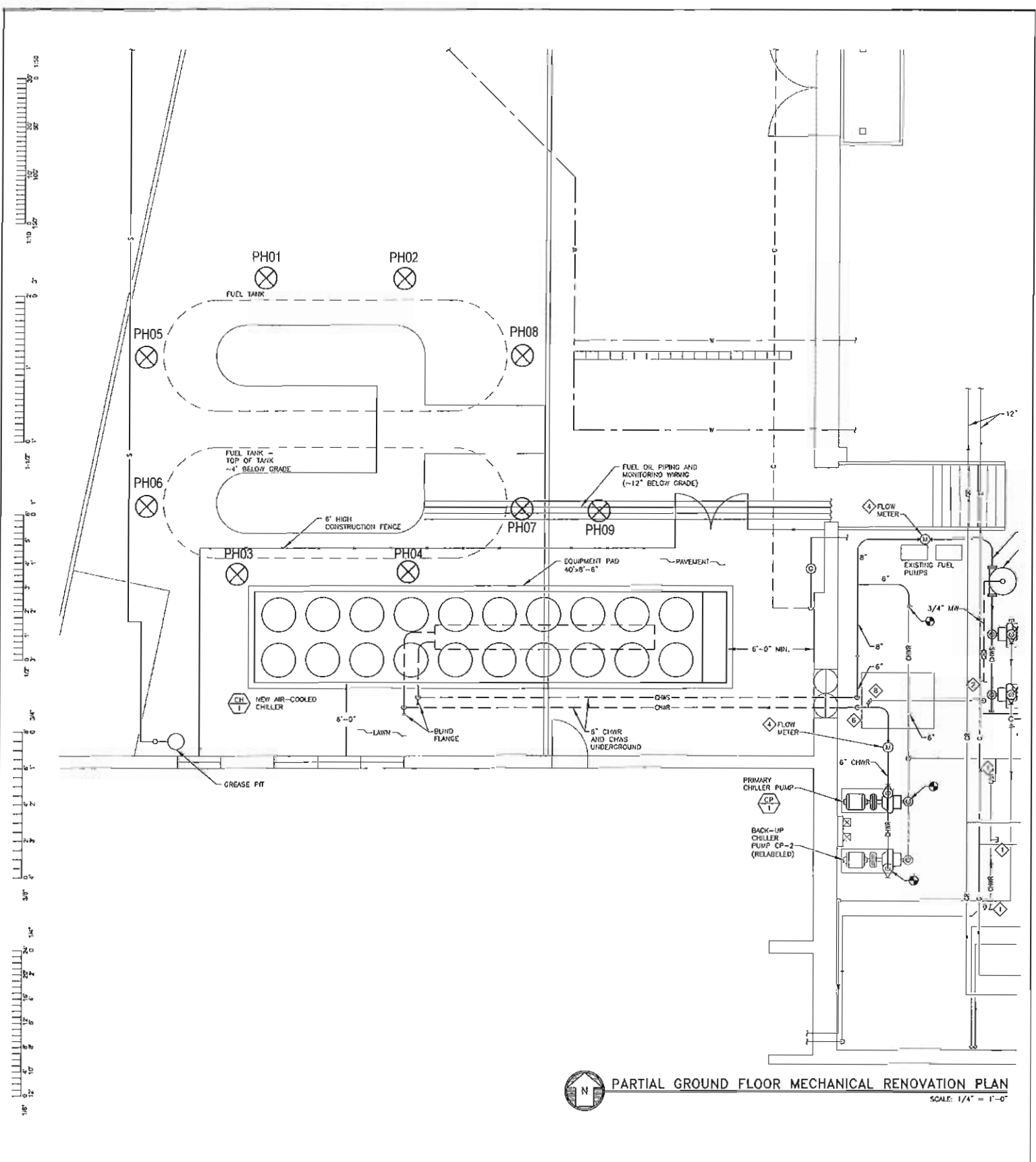
Results of the verification sampling activity indicate that any detected constituent concentrations are well below established Tier 1 Default Target Soil Levels. As required in 10 CSR 80-2.030 (2), MU will proceed with the implementation of recording this in-place UST closure area on the property deed, and complete and submit a Statement of Closure form to MDNR. No further action is necessary at this time.

## FIGURES



Google Earth

FIGURE 1  
SITE LOCATION DIAGRAM  
MIZZOU NORTH  
COLUMBIA, MISSOURI



PARTIAL GROUND FLOOR MECHANICAL RENOVATION PLAN

SCALE: 1/4" = 1'-0"

KEY

⊗ PROBEHOLE LOCATION

SAMPLE LOCATION DIAGRAM  
MIZOU NORTH  
FUEL TANK CLOSURE

FIGURE 2  
NOT TO SCALE

CHECKED BY: DLA	DRAWN BY: CAO	DATE DRAWN: 12-13-10	PROJECT #: 102802.0219	REVISIONS:
--------------------	------------------	-------------------------	---------------------------	------------

**SCHREIBER & YONLEY ASSOCIATES**  
ENVIRONMENTAL ENGINEERS

**APPENDIX A**  
**CLOSURE NOTIFICATION**

August 19, 2016

Missouri Department of Natural Resources  
Hazardous Waste Program/Tanks Section  
PO Box 176  
Jefferson City, MO 65102

RE: Tank Closure Notice for Site ST0008099 (Mizzou North)

To Whom It May Concern:

Please find enclosed The University of Missouri's Closure Notice for the underground storage tanks located at our Mizzou North Facility (ST0008099). The tanks are no longer needed and will not be replaced. The University will give the Department at least a 3 day notice before beginning the actual closure process. Please note that due to the presence of other equipment in direct proximity to the tanks they will be closed in place. If you have any questions you may contact me at 573-884-1926 or by email at [mckanee@missouri.edu](mailto:mckanee@missouri.edu).

Sincerely,



Ed McKane  
Environmental Compliance Professional

Enc.

CC Marsha Smith  
Don Dennis  
Larry Schilke  
Ed Drane





MISSOURI DEPARTMENT OF NATURAL RESOURCES  
HAZARDOUS WASTE PROGRAM  
CLOSURE NOTICE FOR UNDERGROUND STORAGE TANKS

Return completed form to:  
Missouri Department of Natural Resources  
Hazardous Waste Program/Tanks Section  
PO Box 176  
Jefferson City, MO 65102

Closure activities may begin three days after contacting the Tanks Section at 573-751-6822.  
Submit a final closure report to the department within 60 days of tank closures.

**FACILITY INFORMATION**

SITE NAME Mizzou North		FACILITY ID NUMBER (ST NUMBER) 8099		RELEASE NUMBER, IF APPLICABLE	
SITE ADDRESS 115 Business Loop 70 W					
CITY Columbia		STATE MO	COUNTY Boone	ZIP CODE 65203	

**UST OWNER INFORMATION**

NAME Curators of the University of Missouri					
ADDRESS 8 Research Park Development Building					
CITY Columbia		STATE MO		ZIP CODE 65211	
TELEPHONE NUMBER WITH AREA CODE (573) 882-7018			EMAIL ADDRESS environmental@mllsouri.edu		

**FACILITY CONTACT INFORMATION**  SAME AS OWNER INFORMATION (if so, no need to complete this section)

NAME					
ADDRESS					
CITY		STATE		ZIP CODE	
TELEPHONE NUMBER WITH AREA CODE		FACILITY CONTACT PERSON		EMAIL ADDRESS	

**PARTY PERFORMING CLOSURE**

NAME TBD					
ADDRESS					
CITY		STATE		ZIP CODE	
TELEPHONE NUMBER WITH AREA CODE		CONTACT PERSON		EMAIL ADDRESS	

**CERTIFICATION OF PROPER CLOSURE**

I certify that API RP-1604, API Standard 2015, API Standard 1631, Missouri Department of Natural Resources regulations and procedures or other procedures approved by the department will be followed for safety, excavation, handling and disposal of soils and/or other materials; and that soils from beneath the tanks, distribution lines and pump islands will be analyzed in accordance with the requirements outlined in Missouri's UST Closure Guidance.

SIGNATURE OF PARTY PERFORMING CLOSURE/UST OWNER 			DATE 8-18-16		
PREPARED BY Ed McKane		REVIEWED BY		SUBMITTAL DATE	

**UNDERGROUND STORAGE TANKS CLOSED**

Tank ID	Product Stored	Capacity (gallons)	Installation Date	UST Construction Material	In-Use (Active)	Date Emptied	Proposed Method of Closure*
4	diesel	15,000	09/12/1994	Fiberglass	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		I
5	diesel	15,000	09/12/1994	Fiberglass	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		I
					<input type="checkbox"/> Yes <input type="checkbox"/> No		
					<input type="checkbox"/> Yes <input type="checkbox"/> No		
					<input type="checkbox"/> Yes <input type="checkbox"/> No		
					<input type="checkbox"/> Yes <input type="checkbox"/> No		
					<input type="checkbox"/> Yes <input type="checkbox"/> No		
					<input type="checkbox"/> Yes <input type="checkbox"/> No		
					<input type="checkbox"/> Yes <input type="checkbox"/> No		

\* R=Removal, I=In-place

**USER REGISTRATION**

Are USTs registered?  Yes  No

Will new tanks be installed?  Yes  No

Please note, if new USTs are to be installed, a new installation notification form, available online at [dnr.mo.gov/forms/780-1949-f.pdf](http://dnr.mo.gov/forms/780-1949-f.pdf), must be completed and submitted at least 30 days prior to beginning the system installation.

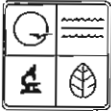
**DEPARTMENT REVIEW**

SIGNATURE OF AUTHORIZED DEPARTMENT REPRESENTATIVE

DATE

**APPENDIX B**

**MDNR CLOSURE REPORT FORM**



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
 HAZARDOUS WASTE PROGRAM  
**CLOSURE REPORT FOR PETROLEUM RELEASES  
 AT UNDERGROUND STORAGE TANK SITES**

Return completed form to:  
 Missouri Department of Natural Resources  
 Hazardous Waste Program/Tanks Section  
 PO Box 176  
 Jefferson City, MO 65102

SITE NAME Ellis Fischel Cancer Center		SITE NUMBER ST0008099	RELEASE NUMBER N/A
SITE ADDRESS 115 Business Loop 70W			
CITY Columbia		STATE MO	ZIP CODE 65203
PREPARED BY	REVIEWED BY	SUBMITTAL DATE	

FACILITY INFORMATION			
NAME Ellis Fishel Cancer Center			
ADDRESS 115 Business Loop 70W			
CITY Columbia		STATE MO	ZIP CODE 65203
TELEPHONE NUMBER WITH AREA CODE (573) 884-1926		E-MAIL ADDRESS McKaneE@missouri.edu	
DATE OF PROJECT INITIATION 11/17/2016		DATE OF PROJECT COMPLETION 12/2/2016	

UNDERGROUND STORAGE TANK (UST) OWNER INFORMATION			
NAME The Curators of the University of Missouri			
ADDRESS 8 Research Development Building			
CITY Columbia		STATE MO	ZIP CODE 65211
TELEPHONE NUMBER WITH AREA CODE (573) 882-7018	CONTACT PERSON Todd Houts		E-MAIL ADDRESS HoutsT@missouri.edu

PARTY PERFORMING CLOSURES			
NAME Schreiber, Yonley & Associates			
ADDRESS 16252 Westwoods Business Park Dr.			
CITY Ellisville		STATE MO	ZIP CODE 63021
TELEPHONE NUMBER WITH AREA CODE 636-256-5643	CONTACT PERSON Doug Abeln		E-MAIL ADDRESS DougA@syaeng.com

CERTIFICATION OF PROPER CLOSURE	
I certify that the information in this report is true and complete.	
SIGNATURE OF PARTY PERFORMING CLOSURE  Doug L. Abeln <small>E:\jls\signed by Doug L. Abeln D:\m\9095\1_Abeln.dwg created by doug@syang.com, c:\US Date:2016.12.09 13:32:40</small>	DATE 12/20/2016
SIGNATURE OF OWNER/OPERATOR  	DATE

MO 780-2120 (10-12)

**UNDERGROUND STORAGE TANK DISPOSAL INFORMATION**

Fate of tank:  Recycle/Savage  Landfill  Unregulated (explain)  
 In-Place Closure

FINAL DESTINATION OF TANKS  
 N/A

ADDRESS OF FINAL DESTINATION	CITY	STATE	ZIP CODE
N/A			

**SOIL DISPOSAL INFORMATION**

CUBIC YARDS OF SOIL EXCAVATED	CUBIC YARDS OF NON-CONTAMINATED SOIL RETURNED TO PIT	CUBIC YARDS OF CONTAMINATED SOIL DISPOSED OR RETURNED
15	15	0

**DISPOSAL OF PETROLEUM-CONTAMINATED WATER**

GALLONS OF WASTEWATER GENERATED  
 N/A

Check disposable method and explain:  
 Hazardous waste disposal firm:  
 On-site discharge under general permit limits:  
 Discharge to wastewater treatment plant:

**DISPOSAL OF SLUDGE/RINSATE**

GALLONS OF SLUDGE/RINSATE DISPOSED  
 500 Gallons

HAZARDOUS WASTE DISPOSAL FIRM  
 Valicor

HAZARDOUS WASTE DISPOSAL FIRM ADDRESS	CITY	STATE	ZIP CODE
5450 Brown Ave	St. Louis	MO	63120

**UNDERGROUND STORAGE TANKS CLOSED**

Tank Number	Capacity (gallons)	Year Installed	Date removed from service (use)	Underground Storage Tank Construction Material	Product Stored	Method of Closure*
4	15,000	1994	11/22/2016	Fiberglass	Diesel	I
5	15,000	1994	11/22/2016	Fiberglass	Diesel	I

\* R=Removal, I=In-place

**USER REGISTRATION**

Are Underground Storage Tanks registered?  Yes  No

**MANDATORY ATTACHMENTS**

- |  |  |
|--|--|
| <p>1. Attach a map or multiple maps of the site which includes:</p> <ul style="list-style-type: none"> <li>a) Size and contents of all Underground Storage Tanks.</li> <li>b) Locations and lengths of all fuel lines.</li> <li>c) Locations of all pump islands.</li> <li>d) Location of the excavation pit boundaries.</li> <li>e) Locations of all required samples using the specified labeling format.</li> <li>f) Location of all above ground tanks and associated piping, plus the size and contents of each.</li> <li>g) Depth to the bottom of each tank and depth of all excavations.</li> <li>h) Direction and degree of slope on the site.</li> <li>i) Scale of the sketch in feet.</li> <li>j) Properties immediately adjacent to the site.</li> </ul> | <p>2. Attach color photographs of the following:</p> <ul style="list-style-type: none"> <li>a) All sides of the removed Underground Storage Tanks.</li> <li>b) Each wall and floor of the excavation pit, if USTs are removed.</li> <li>c) All sealed vent or pipe lines (if applicable).</li> <li>d) The sealed Underground Storage Tanks, if closed in-place.</li> <li>e) The site before the initiation of the closure and after the completion of the closure.</li> </ul> <p>3. Attach appropriate documentation of soil disposal or treatment.</p> <p>4. Attach copy of "Virgin Product Disposal Form" or "Special Waste Form" if applicable.</p> <p>5. Attach bills of sale/certificate of disposal.</p> |
|--|--|

RESULTS OF SOIL ANALYSIS																		
SITE NUMBER ST0008099			SUBMITTAL DATE 12/20/2016						PREPARED BY Doug Abeln									
Select one:	On-site	On-site	On-site	On-site	On-site	On-site	On-site	On-site	On-site	On-site	On-site	On-site	On-site	On-site	On-Site	Off-Site		
	Off-site	Off-site	Off-site	Off-site	Off-site	Off-site	Off-site	Off-site	Off-site	Off-site	Off-site	Off-site	Off-site					
MW / SB No.	PH01	PH02	PH04	PH05	PH06	PH07	PH08	PH09							Arithmetic Average	Maximum	Arithmetic Average	Maximum
Sampling Date	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1							Only for review purposes, not necessarily used as representative concentrations.			
Sample Depth (feet)	20-21	20-21	17-18	20-21	19-20	19-20	18-19	4-5										
Organics (all concentrations must be in mg/kg)																		
Benzene	<0.041	<0.049	<0.045	<0.044	<0.043	<0.042	<0.039	<0.048										
Toluene	<0.041	<0.049	<0.045	<0.044	<0.043	<0.042	<0.039	<0.048										
Ethyl benzene	<0.041	<0.049	<0.045	<0.044	<0.043	<0.042	<0.039	<0.048										
Xylenes (mixed)	<0.120	<0.150	<0.130	<0.130	<0.130	<0.130	<0.120	<0.140										
Ethylene Dibromide (EDB)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A										
Ethylene Dichloride (EDC)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A										
Methyl-tert-butyl-ether (MTBE)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A										
Acenaphthene	<0.0078	<0.0087	<0.0081	<0.0078	<0.0081	<0.0078	<0.0074	0.033										
Anthracene	<0.0078	<0.0087	<0.0081	<0.0078	<0.0081	<0.0078	<0.0074	0.049										
Benzo(a)anthracene	<0.0078	<0.0087	0.045	<0.0078	0.017	<0.0078	0.056	0.096										
Benzo(a)pyrene	<0.0078	<0.0087	0.044	<0.0078	0.013	<0.0078	0.056	0.079										
Benzo(b)fluoranthene	<0.0078	<0.0087	0.068	<0.0078	0.023	<0.0078	0.076	0.110										
Benzo(k)fluoranthene	<0.0078	<0.0087	0.025	<0.0078	0.011	<0.0078	0.036	0.036										
Chrysene	<0.0078	<0.0087	0.032	<0.0078	<0.0081	<0.0078	0.050	0.110										
Dibenzo(a,h)anthracene	<0.0078	<0.0087	0.018	<0.0078	<0.0081	<0.0078	0.021	0.016										
Fluoranthene	<0.0078	0.11	0.053	<0.0078	0.019	0.013	0.110	0.170										
Fluorene	<0.0078	<0.0087	<0.0081	<0.0078	<0.0081	<0.0078	<0.0074	0.065										
Naphthalene	<0.0078	<0.0087	<0.0081	<0.0078	<0.0081	<0.0078	<0.0074	<0.0081										
Pyrene	<0.0078	0.016	0.055	<0.0078	0.018	0.015	0.092	0.170										
TPH-GRO	NA	NA	NA	NA	NA	NA	NA	NA										
TPH-DRO	<5.8	<6.5	<6.1	<5.8	28	<5.9	<5.5	110										
TPH-ORO	NA	NA	NA	NA	NA	NA	NA	NA										
Tertiary-aryl-methyl-ether (TAME)	NA	NA	NA	NA	NA	NA	NA	NA										

**RESULTS OF SOIL ANALYSIS (CONTINUED)**

Tertiary-butyl- alcohol (TBA)	NA	NA	NA	NA	NA	NA	NA	NA									
Ethyl-tert-butyl-ether (ETBE)	NA	NA	NA	NA	NA	NA	NA	NA									
Di-isopropyl ether (DIPE)	NA	NA	NA	NA	NA	NA	NA	NA									
Ethanol	NA	NA	NA	NA	NA	NA	NA	NA									
Methanol	NA	NA	NA	NA	NA	NA	NA	NA									
<b>Metals (all concentrations must be in mg/kg)</b>																	
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA									
Barium	NA	NA	NA	NA	NA	NA	NA	NA									
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA									
Chromium (III)	NA	NA	NA	NA	NA	NA	NA	NA									
Chromium (VI)	NA	NA	NA	NA	NA	NA	NA	NA									
Lead	NA	NA	NA	NA	NA	NA	NA	NA									
Selenium	NA	NA	NA	NA	NA	NA	NA	NA									

Note: Non-detects must be entered as <detection limit (for example: <0.005).

Maximum is the greater of (i) the detected values, and (ii) one-half of the detection limit.

Mandatory Attachments: 1. Site map showing location(s) of surficial soil samples.

2. Any laboratory analytical datasheets and chain of custody forms not previously submitted to the department.

N/A: Not applicable

MO 780-2120 (10-12)

RESULTS OF GROUNDWATER ANALYSIS													
SITE NUMBER					SUBMITTAL DATE					PREPARED BY			
MW / SB Number												Arithmetic Average	Maximum
Sampling Date												Only for review purposes, not necessarily used as representative concentrations.	
Sample Depth (ft)													
Organics (all concentrations must be in mg/L)													
Benzene													
Toluene													
Ethyl benzene													
Xylenes (mixed)													
Ethylene Dibromide (EDB)													
Ethylene Dichloride (EDC)													
Methyl-tert-butyl-ether(MTBE)													
Acenaphthene													
Anthracene													
Benzo(a)anthracene													
Benzo(a)pyrene													
Benzo(b)fluoranthene													
Benzo(k)fluoranthene													
Chrysene													
Dibenzo(a,h)anthracene													
Fluoranthene													
Fluorene													
Naphthalene													
Pyrene													
TPH-GRO													
TPH-DRO													
TPH-ORO													
Tertiary-amyl-methyl-ether (TAME)													
Tertiary-butyl- alcohol (TBA)													



**RESULTS OF GROUNDWATER ANALYSIS (CONTINUED)**

Ethyl-tert-butyl-ether ( ETBE)																				
Di-isopropyl ether ( DIPE)																				
Ethanol																				
Methanol																				
<b>Metals (all concentrations must be in mg/L)</b>																				
Arsenic																				
Barium																				
Cadmium																				
Chromium (III)																				
Chromium (VI)																				
Lead																				
Selenium																				

Note: Non-detects must be entered as <detection limit (for example: <0.005).  
 Maximum is the greater of (i) the detected values, and (ii) one-half of the detection limit.  
 Mandatory Attachments: 1. Site map showing location(s) of surficial soil samples.  
 2. Any laboratory analytical datasheets and chain of custody forms not previously submitted to the department.

N/A: Not applicable  
 MO 780-2120 (10-12)

**APPENDIX C**  
**PHOTOGRAPHS**



1. Removal of concrete around UST manways



2. Removal of concrete around UST manways

MIZZOU NORTH  
FUEL TANK CLOSURE  
COLUMBIA, MISSOURI

By: Hunt  
Environmental

Date: 11/21/16





3. Removal of concrete and soil around UST manways

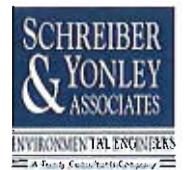


4. Inside view of UST

**MIZZOU NORTH  
FUEL TANK CLOSURE  
COLUMBIA, MISSOURI**

**By: Hunt  
Environmental**

**Date: 11/21/16**





5. Inside view of UST



6. Inside view of UST

**MIZZOU NORTH  
FUEL TANK CLOSURE  
COLUMBIA, MISSOURI**

**By: Hunt  
Environmental**

**Date: 11/21/16**





7. Inside view of UST



8. Inside view of UST

MIZZOU NORTH  
FUEL TANK CLOSURE  
COLUMBIA, MISSOURI

By: Hunt  
Environmental

Date: 11/21/16





9. Concrete being placed in UST



10. Concrete being placed in UST

**MIZZOU NORTH  
FUEL TANK CLOSURE  
COLUMBIA, MISSOURI**

**By: Hunt  
Environmental**

**Date: 11/21/16**





11. Concrete in UST



12. Compaction of fill material

MIZZOU NORTH  
FUEL TANK CLOSURE  
COLUMBIA, MISSOURI

By: Hunt  
Environmental

Date: 11/21/16







13. Compaction of fill material



14. View of site after closure

**MIZZOU NORTH  
FUEL TANK CLOSURE  
COLUMBIA, MISSOURI**

**By: Hunt  
Environmental**

**Date: 11/21/16**





15. Location of PH01



16. PH01 soil cores

MIZZOU NORTH  
FUEL TANK CLOSURE  
COLUMBIA, MISSOURI

By: DLA  
Date: 12/1/16





17. Location of PH02



18. PH02 soil cores

MIZZOU NORTH  
FUEL TANK CLOSURE  
COLUMBIA, MISSOURI

By: DLA  
Date: 12/1/16





19. Location of PH03



20. PH03 soil cores

MIZZOU NORTH  
FUEL TANK CLOSURE  
COLUMBIA, MISSOURI

By: DLA  
Date: 12/1/16





21. PH04 soil cores



22. Location of PH04

MIZZOU NORTH  
FUEL TANK CLOSURE  
COLUMBIA, MISSOURI

By: DLA  
Date: 12/1/16

**SCHREIBER  
& YONLEY  
ASSOCIATES**  
ENVIRONMENTAL ENGINEERS  
A Tenby Construction Company



23. Location of PH06



24. PH06 soil core

MIZZOU NORTH  
FUEL TANK CLOSURE  
COLUMBIA, MISSOURI

By: DLA  
Date: 12/1/16





25. Location of PH07



26. PH07 soil cores

MIZZOU NORTH  
FUEL TANK CLOSURE  
COLUMBIA, MISSOURI

By: DLA  
Date: 12/1/16





27. Location of PH08



28. PH08 soil cores

MIZZOU NORTH  
FUEL TANK CLOSURE  
COLUMBIA, MISSOURI

By: DLA  
Date: 12/1/16







29. Location of PH09



30. PH09 soil core

MIZZOU NORTH  
FUEL TANK CLOSURE  
COLUMBIA, MISSOURI

By: DLA  
Date: 12/1/16





31. Utility line near PH03



32. Utility lines in pipe trench

**MIZZOU NORTH  
FUEL TANK CLOSURE  
COLUMBIA, MISSOURI**

**By: DLA  
Date: 12/1/16**





33. Utility lines in pipe trench

MIZZOU NORTH  
FUEL TANK CLOSURE  
COLUMBIA, MISSOURI

By: DLA  
Date: 12/1/16



**APPENDIX D**  
**DIESEL FUEL MANIFESTS**



Location

SERVICE ORDER

MILES FUELS, LLC  
In Case of an Emergency Call  
Chemtrec 1-800-424-9300

Date: 11-17-16  
Manifest # 01267  
Federal / State ID #: C8506

Generator/Customer/Job Site:  
Name:  
Address: 115 N. GARTH AVE  
City, State, Zip: Columbia, Mo 65203  
Phone Number:

Contractor:  
Name: Hunt Environmental  
Address: 9909 Manchester Rd  
City, State, Zip: St. Louis Mo 63122  
Phone Number: 618-795-3977 - Ken

Transporter 1: Miles Fuels, LLC  
Transporter 2:

US EPA ID Number: MOR000553800  
US EPA ID Number:

Designated Facility and Site Address  
96 Algana  
St. Peters, MO 63376

Facility's Phone: 6364776475  
US EPA ID Number: MOR000553800

HM	Quantity	UOM	Container No. Type	Description	\$ Each	Amount	Gauge	1st	2nd	3rd
				Non-Hazardous Used Oil Collected			Open			
				Non-Hazardous Oily Water/Coolant			Close			
				Service Charge			BS&W			
				Hourly Charge			Net			
				Used Oil Filters			Net	Tare	Gross	
				Non-Hazardous Solids/Liquids						
				U.N. 1203, Gasoline, 3, PGII						
	5.032		1 G	N.A. 1993, Diesel Fuel, 3, PGIII						
				N.A. 1993, Fuel Oil, 3, PGIII		\$0.00				
				UN1267, Petroleum Crude Oil, 3, PGI						
				Used Oil, Burner Fuel #4 - Delivery						
				UN 1993, Combustible Liquid n.o.s., (Naptha), 3, PG III, ERG # 128, NO PLACARDING REQUIREMENTS FOR NON-BULK COMBUSTIBLE LIQUIDS						
				UN 1993, RQ, Combustible Liquid n.o.s., (Naptha), 3, PG III, ERG # 128						
				Lab Sample						

Printed Customer Name PER Ken Deal Customer Signature \_\_\_\_\_ Date 11-17-16  
(PLEASE SEE GENERATOR CERTIFICATION TERMS AND CONDITIONS ON REVERSE) (CUSTOMER AGREES TO ADDITIONAL TERMS ON REVERSE)

TICKET/MANIFEST/VEHICLE # 01267 DATE 11-17-16

Arrival Time: \_\_\_\_\_ Begin Loading: \_\_\_\_\_ Ending Loading: \_\_\_\_\_ Depart Time: \_\_\_\_\_

HAVE YOU INSPECTED THE WORK PERFORMED? WAS THE WORK PERFORMED TO YOUR SATISFACTION?	Yes	No	How Would you rate the overall performance?	Poor <input type="checkbox"/>	Fair <input type="checkbox"/>	Excellent <input type="checkbox"/>
--	-----	----	---	-------------------------------	-------------------------------	------------------------------------

Transporter 1 Printed / Typed: LONG WALK Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Designated Facility Owner/Operator: Certification of Receipt of Product covered by the manifest except as noted in items listed on reverse.

Printed / Typed Name: Vince Miller Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Remarks: \_\_\_\_\_ Next Service Date: Oil \_\_\_\_\_ Filter \_\_\_\_\_

Driver Name Tom T. Weseel Driver Signature Tom T. Weseel

Office Use Only	Retain Sample	Yes	No	Office Use Only	Check	Cash	Credit
	Chlor-D-Tec Results	Pass	Fail	Amount	Direct Deposit	Credit Card	

CUSTOMER

Customer Payment Terms: 10 Days Net



Location

SERVICE ORDER

MILES FUELS, LLC  
In Case of an Emergency Call  
Chemtrec 1-800-424-9300

Date: 11-18-16  
Manifest # 01268  
Federal / State ID #: CBSQG

Generator/Customer/Job Site:  
Name:  
Address: 115 N. Garth Ave  
City, State, Zip: Columbia, Mo 65203  
Phone Number:

Contractor:  
Name: Hunt Environmental  
Address: 9909 Manchester Rd  
City, State, Zip: St. Louis, Mo 63122  
Phone Number: 618-795-3977-1515

Transporter 1: Miles Fuels, LLC  
Transporter 2:

US EPA ID Number: MOR000553800  
US EPA ID Number:

Designated Facility and Site Address  
96 Algana  
St. Peters, MO 63376

Facility's Phone: 6364776475  
US EPA ID Number: MOR000553800

HM	Quantity	UOM	Container No. Type	Description	\$ Each	Amount	Gauge	1st	2nd	3rd
				Non-Hazardous Used Oil Collected			Open			
				Non-Hazardous Oily Water/Coolant			Close			
				Service Charge			BS&W			
				Hourly Charge			Net			
				Used Oil Filters			Net			
				Non-Hazardous Solids/Liquids						
				U.N. 1203, Gasoline, 3, PGII			Net	Tare	Gross	
	8,241		1 G	N.A. 1993, Diesel Fuel, 3, PGIII		83.00				
				N.A. 1993, Fuel Oil, 3, PGIII						
				UN1267, Petroleum Crude Oil, 3, PGI						
				Used Oil, Burner Fuel #4 - Delivery						
				UN 1993, Combustible Liquid n.o.s., (Naptha), 3, PG III, ERG # 128, NO PLACARDING REQUIREMENTS FOR NON-BULK COMBUSTIBLE LIQUIDS						
				UN 1993, RO, Combustible Liquid n.o.s., (Naptha), 3, PG III, ERG # 128						
				Lab Sample						

Printed Customer Name: Miss Ren Davis Customer Signature: \_\_\_\_\_ Date: 11-18-16  
(PLEASE SEE GENERATOR CERTIFICATION TERMS AND CONDITIONS ON REVERSE) (CUSTOMER AGREES TO ADDITIONAL TERMS ON REVERSE)

TICKET/MANIFEST/VEHICLE # 01268 DATE \_\_\_\_\_

Arrival Time: \_\_\_\_\_ Begin Loading: \_\_\_\_\_ Ending Loading: \_\_\_\_\_ Depart Time: \_\_\_\_\_

HAVE YOU INSPECTED THE WORK PERFORMED?	Yes	No	How Would you rate the overall performance?	Poor	Fair	Excellent
WAS THE WORK PERFORMED TO YOUR SATISFACTION?				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Transporter 1 Printed / Typed: Danie Alder Signature: \_\_\_\_\_ Date: 11-18-16

Designated Facility Owner/Operator: Certification of Receipt of Product covered by the manifest except as noted in items listed on reverse.

Printed / Typed Name: Danie Alder Signature: \_\_\_\_\_ Date: 11-18-16

Remarks: \_\_\_\_\_ Next Service Date: Oil \_\_\_\_\_ Filter \_\_\_\_\_

Driver Name: Froy T Vesce Driver Signature: Froy T Vesce

Office Use Only	Retain Sample	Yes	No	Office Use Only	Check	Cash	Credit
	Chlor-D-Tec Results	Pass	Fail	Amount	Direct Deposit	Credit Card	

CUSTOMER

Customer Payment Terms: 10 Days Net



Location

SERVICE ORDER

MILES FUELS, LLC  
In Case of an Emergency Call  
Chemtrec 1-800-424-9300

Date: 11-19-16  
Manifest # 01269  
Federal / State ID #: CBS06

Generator/Customer/Job Site:  
Name:

Contractor:  
Name: Hunt Environmental

Address: 115 N. Garth Ave

Address: 9909 Manchester Rd

City, State, Zip: Columbia, Mo 65203

City, State, Zip: St. Louis, Mo 63122

Phone Number:

Phone Number: 618-795-3977-KREN

Transporter 1: Miles Fuels, LLC

US EPA ID Number: MOR000553800

Transporter 2:

US EPA ID Number:

Designated Facility and Site Address

Facility's Phone: 6364776475

96 Algana  
St. Peters, MO 63376

US EPA ID Number: MOR000553800

HM	Quantity	UOM	Container No. Type	Description	\$ Each	Amount	Gauge	1st	2nd	3rd
				Non-Hazardous Used Oil Collected			Open			
				Non-Hazardous Oily Water/Coolant			Close			
				Service Charge			BS&W			
				Hourly Charge			Net			
				Used Oil Filters			Net	Tare	Gross	
				Non-Hazardous Solids/Liquids						
				U.N. 1203, Gasoline, 3, PGII						
	7.974		1 G	N.A. 1993, Diesel Fuel, 3, PGIII		\$0.00				
				N.A. 1993, Fuel Oil, 3, PGIII						
				UN1267, Petroleum Crude Oil, 3, PGI						
				Used Oil, Burner Fuel #4 - Delivery						
				UN 1993, Combustible Liquid n.o.s., (Naptha), 3, PG III, ERG # 128, NO PLACARDING REQUIREMENTS FOR NON-BULK COMBUSTIBLE LIQUIDS						
				UN 1993, RQ, Combustible Liquid n.o.s., (Naptha), 3, PG III, ERG # 128						
				Lab Sample						

Printed Customer Name: PER KAN Deal Customer Signature: \_\_\_\_\_ Date: 11-19-16  
(PLEASE SEE GENERATOR CERTIFICATION TERMS AND CONDITIONS ON REVERSE) (CUSTOMER AGREES TO ADDITIONAL TERMS ON REVERSE)

TICKET/MANIFEST/VEHICLE # 01269 DATE 11-19-16

Arrival Time: \_\_\_\_\_ Begin Loading: \_\_\_\_\_ Ending Loading: \_\_\_\_\_ Depart Time: \_\_\_\_\_

	Yes	No	How Would you rate the overall performance?	Poor <input type="checkbox"/>	Fair <input type="checkbox"/>	Excellent <input type="checkbox"/>
HAVE YOU INSPECTED THE WORK PERFORMED?						
WAS THE WORK PERFORMED TO YOUR SATISFACTION?						

Transporter 1 Printed / Typed: LOWE WALT Signature: Tony T. Neseef Date: 11-19-16  
Designated Facility Owner/Operator: Certification of Receipt of Product covered by the manifest except as noted in items listed on reverse.

Printed / Typed Name: Victor Miller Signature: \_\_\_\_\_ Date: 11-19-16

Remarks: \_\_\_\_\_ Next Service Date: Oil \_\_\_\_\_ Filter \_\_\_\_\_

Driver Name: Tony T. Neseef Driver Signature: Tony T. Neseef

Office Use Only	Retain Sample	Yes/No	Office Use Only	Check/Cash/Credit
	Chlor-D-Tec Results	Pass/Fail	Amount	Direct Deposit/Credit Card

**APPENDIX E**

**RINSEWATER ANALYTICAL RESULTS**



December 12, 2016

Jevon Poncez  
Hunt Vac Service  
4180 Beck Ave.  
St. Louis, MO 63116  
TEL: (314) 243-4770  
FAX: (314) 962-8974



**RE:** University of Missouri Fuel Tank Closure

**WorkOrder:** 16120304

Dear Jevon Poncez:

TEKLAB, INC received 2 samples on 12/6/2016 10:15:00 AM for the analysis presented in the following report.

Samples are analyzed on an as received basis unless otherwise requested and documented. The sample results contained in this report relate only to the requested analytes of interest as directed on the chain of custody. NELAP accredited fields of testing are indicated by the letters NELAP under the Certification column. Unless otherwise documented within this report, Teklab Inc. analyzes samples utilizing the most current methods in compliance with 40CFR. All tests are performed in the Collinsville, IL laboratory unless otherwise noted in the Case Narrative.

All quality control criteria applicable to the test methods employed for this project have been satisfactorily met and are in accordance with NELAP except where noted. The following report shall not be reproduced, except in full, without the written approval of Teklab, Inc.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,



Emily Pohlman  
Project Manager  
(618)344-1004 ex 44  
[epohlman@teklabinc.com](mailto:epohlman@teklabinc.com)



## Report Contents

<http://www.teklabinc.com/>

Client: Hunt Vac Service

Work Order: 16120304

Client Project: University of Missouri Fuel Tank Closure

Report Date: 12-Dec-16

This reporting package includes the following:

Cover Letter	1
Report Contents	2
Definitions	3
Case Narrative	4
Laboratory Results	5
Receiving Check List	7
Chain of Custody	Appended

Client: Hunt Vac Service

Work Order: 16120304

Client Project: University of Missouri Fuel Tank Closure

Report Date: 12-Dec-16

### Abbr Definition

- CCV Continuing calibration verification is a check of a standard to determine the state of calibration of an instrument between recalibration.
- DF Dilution factor is the dilution performed during analysis only and does not take into account any dilutions made during sample preparation. The reported result is final and includes all dilutions factors.
- DNI Did not ignite
- DUP Laboratory duplicate is an aliquot of a sample taken from the same container under laboratory conditions for independent processing and analysis independently of the original aliquot.
- ICV Initial calibration verification is a check of a standard to determine the state of calibration of an instrument before sample analysis is initiated.
- IDPH IL Dept. of Public Health
- LCS Laboratory control sample, spiked with verified known amounts of analytes, is analyzed exactly like a sample to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system. The acceptable recovery range is in the QC Package (provided upon request).
- LCSD Laboratory control sample duplicate is a replicate laboratory control sample that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
- MBLK Method blank is a sample of a matrix similar to the batch of associated sample (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences should present at concentrations that impact the analytical results for sample analyses.
- MDL Method detection limit means the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero.
- MS Matrix spike is an aliquot of matrix fortified (spiked) with known quantities of specific analytes that is subjected to the entire analytical procedures in order to determine the effect of the matrix on an approved test method's recovery system. The acceptable recovery range is listed in the QC Package (provided upon request).
- MSD Matrix spike duplicate means a replicate matrix spike that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
- MW Molecular weight
- ND Not Detected at the Reporting Limit
- NELAP NELAP Accredited
- PQL Practical quantitation limit means the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operation conditions. The acceptable recovery range is listed in the QC Package (provided upon request).
- RL The reporting limit the lowest level that the data is displayed in the final report. The reporting limit may vary according to customer request or sample dilution. The reporting limit may not be less than the MDL.
- RPD Relative percent difference is a calculated difference between two recoveries (ie. MS/MSD). The acceptable recovery limit is listed in the QC Package (provided upon request).
- SPK The spike is a known mass of target analyte added to a blank sample or sub-sample; used to determine recovery deficiency or for other quality control purposes.
- Surr Surrogates are compounds which are similar to the analytes of interest in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.
- TIC Tentatively identified compound: Analytes tentatively identified in the sample by using a library search. Only results not in the calibration standard will be reported as tentatively identified compounds. Results for tentatively identified compounds that are not present in the calibration standard, but are assigned a specific chemical name based upon the library search, are calculated using total peak areas from reconstructed ion chromatograms and a response factor of one. The nearest Internal Standard is used for the calculation. The results of any TICs must be considered estimated, and are flagged with a "T". If the estimated result is above the calibration range it is flagged "ET"
- TNTC Too numerous to count (> 200 CFU)

### Qualifiers

- |  |   |
|--|---|
| # - Unknown hydrocarbon                                      | B - Analyte detected in associated Method Blank |
| E - Value above quantitation range                           | H - Holding times exceeded                      |
| I - Associated internal standard was outside method criteria | J - Analyte detected below quantitation limits  |
| M - Manual Integration used to determine area response       | ND - Not Detected at the Reporting Limit        |
| R - RPD outside accepted recovery limits                     | S - Spike Recovery outside recovery limits      |
| T - TIC(Tentatively identified compound)                     | X - Value exceeds Maximum Contaminant Level     |



Case Narrative

<http://www.teklabinc.com/>

Client: Hunt Vac Service

Work Order: 16120304

Client Project: University of Missouri Fuel Tank Closure

Report Date: 12-Dec-16

Cooler Receipt Temp: 5.02 °C

Locations and Accreditations

	Collinsville	Springfield	Kansas City	Collinsville Air
Address	5445 Horseshoe Lake Road Collinsville, IL 62234-7425	3920 Pintail Dr Springfield, IL 62711-9415	8421 Nieman Road Lenexa, KS 66214	5445 Horseshoe Lake Road Collinsville, IL 62234-7425
Phone	(618) 344-1004	(217) 698-1004	(913) 541-1998	(618) 344-1004
Fax	(618) 344-1005	(217) 698-1005	(913) 541-1998	(618) 344-1005
Email	jhriley@teklabinc.com	KKlostermann@teklabinc.com	Ryoungstrom@teklabinc.com	EHurley@teklabinc.com

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2017	Collinsville
Kansas	KDHE	E-10374	NELAP	4/30/2017	Collinsville
Louisiana	LDEQ	166493	NELAP	6/30/2017	Collinsville
Louisiana	LDEQ	166578	NELAP	6/30/2017	Collinsville
Texas	TCEQ	T104704515-12-1	NELAP	7/31/2017	Collinsville
Arkansas	ADEQ	88-0966		3/14/2017	Collinsville
Illinois	IDPH	17584		5/31/2017	Collinsville
Kentucky	KDEP	98006		12/31/2016	Collinsville
Kentucky	UST	0073		1/31/2017	Collinsville
Missouri	MDNR	00930		5/31/2017	Collinsville
Missouri	MDNR	930		1/31/2017	Collinsville
Oklahoma	ODEQ	9978		8/31/2017	Collinsville



## Laboratory Results

<http://www.teklabinc.com/>

Client: Hunt Vac Service

Work Order: 16120304

Client Project: University of Missouri Fuel Tank Closure

Report Date: 12-Dec-16

Lab ID: 16120304-001

Client Sample ID: 001

Matrix: AQUEOUS

Collection Date: 11/20/2016 9:00

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
<b>SW-846 1020B</b>								
Ignitability, Closed Cup	NELAP	60		>200	°F	1	12/09/2016 16:22	R226744
<b>SW-846 1311, 3010A, 6010B, METALS IN TCLP EXTRACT BY ICP</b>								
Lead	NELAP	0.400		< 0.400	mg/L	1	12/08/2016 21:53	125073
<b>SW-846 1311, 5030, 8260B, VOLATILE ORGANIC COMPOUNDS IN TCLP EXTRACT BY GC/MS</b>								
Benzene	NELAP	0.200	H	ND	mg/L	100	12/08/2016 13:43	125119
Surr: 1,2-Dichloroethane-d4		74.7-129	H	92.0	%REC	100	12/08/2016 13:43	125119
Surr: 4-Bromofluorobenzene		86-119	H	97.7	%REC	100	12/08/2016 13:43	125119
Surr: Dibromofluoromethane		81.7-123	H	90.0	%REC	100	12/08/2016 13:43	125119
Surr: Toluene-d8		84.3-114	H	102.6	%REC	100	12/08/2016 13:43	125119



## Laboratory Results

<http://www.teklabinc.com/>

Client: Hunt Vac Service

Work Order: 16120304

Client Project: University of Missouri Fuel Tank Closure

Report Date: 12-Dec-16

Lab ID: 16120304-002

Client Sample ID: 001

Matrix: OIL

Collection Date: 11/20/2016 9:00

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
<b>SW-846 1020B</b>								
Ignitability, Closed Cup	NELAP	60		165	°F	1	12/09/2016 16:39	R226744
<b>SW-846 1311, 3010A, 6010B, METALS IN TCLP EXTRACT BY ICP</b>								
Lead	NELAP	0.400		< 0.400	mg/L	1	12/08/2016 15:59	125031
<b>SW-846 1311, 5030, 8260B, VOLATILE ORGANIC COMPOUNDS IN TCLP EXTRACT BY GC/MS</b>								
Benzene	NELAP	0.200	JH	0.16	mg/L	100	12/07/2016 13:49	125037
Surr: 1,2-Dichloroethane-d4		74.7-129	H	93.3	%REC	100	12/07/2016 13:49	125037
Surr: 4-Bromofluorobenzene		86-119	H	93.6	%REC	100	12/07/2016 13:49	125037
Surr: Dibromofluoromethane		81.7-123	H	89.7	%REC	100	12/07/2016 13:49	125037
Surr: Toluene-d8		84.3-114	H	100.4	%REC	100	12/07/2016 13:49	125037



# Receiving Check List

<http://www.teklabinc.com/>

Client: Hunt Vac Service

Work Order: 16120304

Client Project: University of Missouri Fuel Tank Closure

Report Date: 12-Dec-16

Carrier: Ken Dill

Received By: AMD

Completed by:

*Kalyn Foecke*

Reviewed by:

*Elizabeth A. Hurley*

On:

06-Dec-16

Kalyn Foecke

On:

06-Dec-16

Elizabeth A. Hurley

Pages to follow: Chain of custody

Extra pages included

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>	Temp °C 5.02
Type of thermal preservation?	None <input type="checkbox"/>	Ice <input checked="" type="checkbox"/>	Blue Ice <input type="checkbox"/>	Dry Ice <input type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		
All samples received within holding time?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		
Reported field parameters measured:	Field <input type="checkbox"/>	Lab <input type="checkbox"/>	NA <input checked="" type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		
<i>When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.</i>				
Water -- at least one vial per sample has zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials <input checked="" type="checkbox"/>	
Water - TOX containers have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No TOX containers <input checked="" type="checkbox"/>	
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>	
NPDES/CWA TCN interferences checked/treated in the field?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>	

Any No responses must be detailed below or on the COC.

Samples received did not meet hold time requirements for TCLP Benzene. Jevon Poncez was notified of this error via work order summary. EAH 12/6/16





**APPENDIX F**

**RINSEWATER MANIFEST**

<b>UNIFORM HAZARDOUS WASTE MANIFEST</b>		1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number <b>014292090 JJK</b>		
5. Generator's Name and Mailing Address <b>Curators of mo Columbia mo 65311</b>				Generator's Site Address (if different than mailing address) <b>115 Garth Ave Columbia mo 65203</b>			
Generator's Phone:				U.S. EPA ID Number			
6. Transporter 1 Company Name <b>Hunt Vac Services</b>				U.S. EPA ID Number			
7. Transporter 2 Company Name				U.S. EPA ID Number			
8. Designated Facility Name and Site Address <b>Valicor 5450 Brown Ave St. Louis MO 63120</b>				U.S. EPA ID Number			
Facility's Phone: <b>314 768-3096</b>							
9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes	
		No.	Type				
1.	<b>Diesel /water</b>			<b>500</b>	<b>G</b>		
2.							
3.							
4.							
14. Special Handling Instructions and Additional Information							
15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.							
Generator's/Offeror's Printed/Typed Name				Signature		Month Day Year	
16. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry/exit: _____ Date leaving U.S.: _____							
17. Transporter Acknowledgment of Receipt of Materials							
Transporter 1 Printed/Typed Name				Signature		Month Day Year	
Transporter 2 Printed/Typed Name <b>John Chapman</b>				Signature		Month Day Year	
18. Discrepancy							
18a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input checked="" type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection							
Manifest Reference Number:							
18b. Alternate Facility (or Generator)				U.S. EPA ID Number			
Facility's Phone:							
18c. Signature of Alternate Facility (or Generator)						Month Day Year	
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)							
1.		2.		3.		4.	
20. Designated Facility Owner or Operator. Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a							
Printed/Typed Name				Signature		Month Day Year	



Valicor Environmental Services certifies that all non-hazardous waste, hazardous waste, universal waste, used oil waste, recyclable waste, waste-to-energy material, and beneficial re-use material is transported, stored, processed, recycled, treated or disposed, and destroyed in a proper manner. We comply with all Federal, State, County, and Municipal regulations as required by law.

All items listed with the attached manifest/shipping order number have been processed accordingly.

**Hunt Vac Services COD**

- \* Invoice 401139/Manifest 0142920903JK
- \* 500 Gallons delivered 11/21/2016

\_\_\_\_\_*Erin C. Alderson*\_\_\_\_\_  
Name

\_\_\_\_\_*11/21/2016*\_\_\_\_\_  
Date

Valicor Environmental Services  
5450 Brown Avenue, St. Louis, MO 63120

**APPENDIX G**  
**READY MIX TICKETS**

DELIVERY RECEIPT

2600 N. Stadium Blvd.  
Columbia, MO 65202  
Dispatch - (573) 445-3901  
Office - (573) 446-0919

# Columbia READY MIX

THE DIFFERENCE IS IN THE SERVICE



**SOLD TO:**

5007  
CPH CASH CUSTOMER

**SHIP TO:**

ELLIS FISCHEL HUNT HAD SERVICES

156156

30003

LOAD TIME	MIX #	LOAD SIZE	YARDS ORDERED	MIX TIME	TRUCK #	MIN. DELIVERY CHG.	TICKET #
8:45	1024	9.00	134.00		115		51805700
DATE	CODE #	LOAD #	YARDS DEL.	BATCH #	USAGE	SLUMP	TRANSACTION #
11/22/16		11	99.00	13323		8.00	12736

**H<sub>2</sub>O Added By Request/Authorized By**

GAL X

NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE, OWNER'S NOTICE, AND WILL BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE.

LOAD RECEIVED BY

X

CONTRACTOR TO PROVIDE WASH OUT AREA

QUANTITY	CODE	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
1	1024	CITY PLUMBING	147.50	147.50
			<b>DELIVERY CHARGE</b>	<b>\$207.00</b>

**PROPERTY DAMAGE RELEASE**

(TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE) THE DRIVER OF THIS TRUCK IN PRESENTING THIS RELEASE TO YOU FOR YOUR SIGNATURE IS OF THE OPINION THAT THE SIZE AND WEIGHT OF HIS TRUCK MAY POSSIBLY CAUSE DAMAGE TO THE PREMISES AND/OR ADJACENT PROPERTY IF HE PLACES THE MATERIAL IN THIS LOAD WHERE YOU DESIRE IT. THE DRIVER IS REQUESTING THAT YOU SIGN THIS RELEASE RELIEVING HIM AND THIS SUPPLIER FROM ANY RESPONSIBILITY FROM ANY DAMAGE THAT MAY OCCUR TO THE PREMISES AND/OR ADJACENT PROPERTY, BUILDINGS, SIDEWALKS, DRIVEWAYS, CURBS, ETC., BY THE DELIVERY OF THIS MATERIAL.

SIGNED

X

Additional Information on Reverse

Subtotal: \$634.50  
Tax: \$24.09

**GRAND TOTAL** ▶ **\$7,354.49**

BATCH DATA	Driver	User	Disp Ticket Num	Ticket ID	Time	Date
117	1751	user	31665066	12736	8:45	11/22/16
Load Size	Mix Code	Returned	Qty	Mix Rpt	Seq	Load ID
9.00	CVTS 1024				D	13323
Material	Region	Qty	Required	Batched	\$ Var.	\$ Moisture
TRK	113.0 lb		1095.0 lb	1095.0 lb	0.00	
GRAB	100.0 lb		24200 lb	24100 lb	-0.50	
WATER	45.0 gal		450.0 gal	450.0 gal	0.00	450.0 gal
Actual	Slump	Batches				
Load Total:	29200 lb		Design 2.724 Water/Cement: 2.937	0	Design 423.0 gal	Actual 450.0 gal
Plant: 8.00	To: 0	Water in Truck: 0.0 gal	Adjust: Water: 0.0 gal	/ Load	Tric Slump: 0.0 gal/ CTE	Notes: Manual feed ok

WEIGHMASTER SIGNATURE X

2600 N. Stadium Blvd.  
Columbia, MO 65202  
Dispatch - (573) 445-3901  
Office - (573) 446-0919

# Columbia READY MIX

THE DIFFERENCE IS IN THE SERVICE



<b>SOLD TO:</b> 5007 CASH CUSTOMER	<b>SHIP TO:</b> ELLIS FISCHEL HUNT VAC SERVICES 150185
--	--

LOAD TIME	MIX #	LOAD SIZE	YARDS ORDERED	MIX TIME	TRUCK #	MIN. DELIVERY CHG.	TICKET #
7:00	1029	9.00	150.00		104		51605753
DATE	CODE #	LOAD #	YARDS DEL	BATCH #	USAGE	SLUMP	TRANSACTION #
11/28/16			9.00	13312		4.00	12715

ROADWAY TO BUS. LOOP L TO SOUTH  
L TO NORTH SIDE OF ELLIS FISCHEL

**H<sub>2</sub>O Added By Request/Authorized By**  
\_\_\_\_\_ GAL X \_\_\_\_\_

NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE, OWNER'S NOTICE, AND WILL BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE.

LOAD RECEIVED BY  
X \_\_\_\_\_

**CONTRACTOR TO PROVIDE WASH OUT AREA**

QUANTITY	CODE	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
		ACTIV FLUORIDE	47.50	1527.50
			<b>DELIVERY CHARGE</b>	<b>\$207.00</b>

**PROPERTY DAMAGE RELEASE**

(TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE) THE DRIVER OF THIS TRUCK IN PRESENTING THIS RELEASE TO YOU FOR YOUR SIGNATURE IS OF THE OPINION THAT THE SIZE AND WEIGHT OF HIS TRUCK MAY POSSIBLY CAUSE DAMAGE TO THE PREMISES AND/OR ADJACENT PROPERTY IF HE PLACES THE MATERIAL IN THIS LOAD WHERE YOU DESIRE IT. THE DRIVER IS REQUESTING THAT YOU SIGN THIS RELEASE RELIEVING HIM AND THIS SUPPLIER FROM ANY RESPONSIBILITY FROM ANY DAMAGE THAT MAY OCCUR TO THE PREMISES AND/OR ADJACENT PROPERTY, BUILDINGS, SIDEWALKS, DRIVEWAYS, CURBS, ETC., BY THE DELIVERY OF THIS MATERIAL.

SIGNED  
X \_\_\_\_\_

**Additional Information on Reverse**

Subtotal	\$634.50
Tax	\$34.00
<b>GRAND TOTAL</b>	<b>\$668.50</b>

BATCH DATA	Driver	User	Disp	Ticket Num	Ticket ID	Time	Date
104	Bill	user	51605753	12715	7:00	11/28/16	
Load Size	Mix Code	Returned	Qty	Mix Age	Seq	Load ID	
9.00	1029				11	13312	
Material	Design Qty	Required	Actual	# Ties	# Moisture	Actual Wat	
WATER	145.0 lb	125.0 lb	130.0 lb	-1.2%			
CEMENT	300.0 lb	243.0 lb	242.0 lb	-0.1%			
ADJ. WATER	17.0 gal	96.0 gal	39.0 gal	0.00%		39.0 gal	
Load Total:	390.0 lb	Design 2.724	Water/Cement 2.502	Design 423.0 gal	Actual 396.0 gal	To Add: 27.0 gal	
Slump:	1.25 in	# Water in truck: 3.0 gal	Adjst. Water: 0.0 gal	/ Load: 7.9 gal	Wet: 7.9 gal	Wet: Manual feed or	

WEIGHMASTER SIGNATURE Y



2600 N. Stadium Blvd.  
 Columbia, MO 65202  
 Dispatch - (573) 445-3901  
 Office - (573) 446-0919

# Columbia READY MIX

THE DIFFERENCE IS IN THE SERVICE



<b>SOLD TO:</b> 3907 CASH CUSTOMER	<b>SHIP TO:</b> ELLIS FISCHEL MUNT VDC SERVICES 156186
80003	

LOAD TIME	MIX #	LOAD SIZE	YARDS ORDERED	MIX TIME	TRUCK #	MIN. DELIVERY CHG.	TICKET #
5:43	1024	9.00	100.00		115		31005776
DATE	CODE #	LOAD #	YARDS DEL.	BATCH #	USAGE	SLUMP	TRANSACTION #
11/22/16		17	100.00	13332		0.00	18735

STADIUM TO BUS. LOOP L TO GARTH  
 TO NORTH SIDE OF ELLIS FISCHEL

**H<sub>2</sub>O Added By Request/Authorized By**  
 \_\_\_\_\_  
 GAL X

**CONTRACTOR TO PROVIDE WASH OUT AREA**

X \_\_\_\_\_

NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE, OWNER'S NOTICE, AND WILL BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE

QUANTITY	CODE	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
100.00	100	CITY FLOWABLE PI	\$47.50	\$4750.00

DELIVERY CHARGE \$207.00

**PROPERTY DAMAGE RELEASE**

(TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE) THE DRIVER OF THIS TRUCK IN PRESENTING THIS RELEASE TO YOU FOR YOUR SIGNATURE IS OF THE OPINION THAT THE SIZE AND WEIGHT OF HIS TRUCK MAY POSSIBLY CAUSE DAMAGE TO THE PREMISES AND/OR ADJACENT PROPERTY IF HE PLACES THE MATERIAL IN THIS LOAD WHERE YOU DESIRE IT. THE DRIVER IS REQUESTING THAT YOU SIGN THIS RELEASE RELIEVING HIM AND THIS SUPPLIER FROM ANY RESPONSIBILITY FROM ANY DAMAGE THAT MAY OCCUR TO THE PREMISES AND/OR ADJACENT PROPERTY, BUILDINGS, SIDEWALKS, DRIVEWAYS, CURBS, ETC., BY THE DELIVERY OF THIS MATERIAL.

SIGNED \_\_\_\_\_  
 X \_\_\_\_\_

Additional Information on Reverse

Subtotal	\$4965.00
Tax	\$207.00
<b>GRAND TOTAL</b>	<b>\$5172.00</b>

BATCH DATA	Driver	Meter	Disp Ticket	Mix Ticket	ID	Time	Date
115	373	100	31005776	13332		5:43	11/22/16
Load Size	Mix Code	Returned	Qty	Mix Age	Qty	Load ID	
9.00	1024					13332	
Design	Design	Design	Design	Design	Design	Design	
100.00	1024	100.00	100.00	100.00	100.00	100.00	
Water	Water	Water	Water	Water	Water	Water	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	

WEIGHMASTER SIGNATURE X \_\_\_\_\_



2600 N. Stadium Blvd.  
Columbia, MO 65202  
Dispatch - (573) 445-3901  
Office - (573) 446-0919

# Columbia READY MIX



THE DIFFERENCE IS IN THE SERVICE

<b>SOLD TO:</b> 5007 CPN CASH CUSTOMER	<b>SHIP TO:</b> ELLIS FISCHEL MUNT VAC SERVICES 376186
--	---

LOADTIME	MIX #	LOAD SIZE	YARDS ORDERED	MIX TIME	TRUCK #	MIN. DELIVERY CHG.	TICKET #
9:03	1024	9.00	150.00		117		51605760
DATE	CODE #	LOAD #	YARDS DEL.	BATCH #	USAGE	SLUMP	TRANSACTION #
11/22/16		13	117.90	13325		8.00 in	12720

STADIUM TO BUS. LOOP L TO GARTH TO NORTH SIDE OF ELLIS FISCHEL	<b>H<sub>2</sub>O Added By Request/Authorized By</b> _____ GAL X
NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE, OWNER'S NOTICE, AND WILL BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE	
<b>LOAD RECEIVED BY</b> X _____	

CONTRACTOR TO PROVIDE WASH OUT AREA

QUANTITY	CODE	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
9.00	1024	CITY FLOWABLE FT	\$47.30	\$427.50

DELIVERY CHARGE \$207.00

**PROPERTY DAMAGE RELEASE**

(TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE) THE DRIVER OF THIS TRUCK IN PRESENTING THIS RELEASE TO YOU FOR YOUR SIGNATURE IS OF THE OPINION THAT THE SIZE AND WEIGHT OF HIS TRUCK MAY POSSIBLY CAUSE DAMAGE TO THE PREMISES AND/OR ADJACENT PROPERTY IF HE PLACES THE MATERIAL IN THIS LOAD WHERE YOU DESIRE IT. THE DRIVER IS REQUESTING THAT YOU SIGN THIS RELEASE RELIEVING HIM AND THIS SUPPLIER FROM ANY RESPONSIBILITY FROM ANY DAMAGE THAT MAY OCCUR TO THE PREMISES AND/OR ADJACENT PROPERTY, BUILDINGS, SIDEWALKS, DRIVEWAYS, CURBS, ETC.. BY THE DELIVERY OF THIS MATERIAL.

Subtotal \$634.50  
Tax \$34.07

SIGNED  
X \_\_\_\_\_

Additional Information on Reverse

**GRAND TOTAL** ▶ \$6,691.67

BATCH DATA	Driver	User	Disp Ticket Num	Ticket ID	Time	Date	
117	290	user	51605760	12720	9:02	11/22/16	
Load Size	Mix Code	Returned	Qty	Mix Age	Seq	Load ID	
9.00 CYDS	1024				0	13325	
Material	Design Qty	Required	Batched	% Var	Moisture	Actual Wet	
TYPE1	144.0 lb	1295.0 lb	1270.0 lb	-1.85%			
SPNG	3690 lb	2420.0 lb	2410.0 lb	-0.67%			
WATER	47.0 gal	450.0 gal	450.0 gal	0.00%		450.0 gal	
Actual	Non Batches:						
Load Total:	27222 lb	Design 3.734	Water/Cement 3.011	0	Design 423.0 gal	Actual 450.0 gal	To Add: 0.0
Slump:	8.00 in	Water in Truck: 0.0 gal	Adjust Water: 0.0 gal	/ Load	Wet Water: 0.0 gal	D/W	Wet: Manual feed ok

WEIGHMASTER SIGNATURE X \_\_\_\_\_

2600 N. Stadium Blvd.  
Columbia, MO 65202  
Dispatch - (573) 445-3901  
Office - (573) 446-0919

# Columbia READY MIX

THE DIFFERENCE IS IN THE SERVICE



<b>SOLD TO:</b> 5807 CBA CASH CUSTOMER	<b>SHIP TO:</b> ELLIS FISCHEL HUNT VAC SERVICES 136186
--	--

LOAD TIME	MIX #	LOAD SIZE	YARDS ORDERED	MIX TIME	TRUCK #	MIN. DELIVERY CHG.	TICKET #
9:23	1024	9.00	150.00		107		51605771
DATE	CODE #	LOAD #	YARDS DEL.	BATCH #	USAGE	SLUMP	TRANSACTION #
11/22/15		14	125.00	13320		9.00 in	12731

STADIUM TO BUS. LOOP L TO SOUTH TO NORTH SIDE OF ELLIS FISCHEL

**H<sub>2</sub>O Added By Request/Authorized By**  
GAL X

NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE, OWNER'S NOTICE, AND WILL BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE

LOAD RECEIVED BY  
X

**CONTRACTOR TO PROVIDE WASH OUT AREA**

QUANTITY	CODE	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
9.00 YD	1024	CITY FLOWABLE PL	147.50	1427.50

DELIVERY CHARGE \$367.00

**PROPERTY DAMAGE RELEASE**

(TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE) THE DRIVER OF THIS TRUCK IN PRESENTING THIS RELEASE TO YOU FOR YOUR SIGNATURE IS OF THE OPINION THAT THE SIZE AND WEIGHT OF HIS TRUCK MAY POSSIBLY CAUSE DAMAGE TO THE PREMISES AND/OR ADJACENT PROPERTY IF HE PLACES THE MATERIAL IN THIS LOAD WHERE YOU DESIRE IT. THE DRIVER IS REQUESTING THAT YOU SIGN THIS RELEASE RELIEVING HIM AND THIS SUPPLIER FROM ANY RESPONSIBILITY FROM ANY DAMAGE THAT MAY OCCUR TO THE PREMISES AND/OR ADJACENT PROPERTY, BUILDINGS, SIDEWALKS, DRIVEWAYS, CURBS, ETC., BY THE DELIVERY OF THIS MATERIAL.

SIGNED

X

Additional Information on Reverse

Subtotal: \$634.50  
Tax: \$34.09

**GRAND TOTAL** \$9,350.35

BATCH DATA	Driver	User	Disp Ticket Num	Ticket ID	Time	Date
107	2703	user	51605771	12731	9:22	11/22/15
Load Size	Mix Code	Returned	Qty	Mix Age	Sec	Load ID
9.00 CYDS	1024				D	13320
Material	Design Qty	Required	Batched	% Var	% Moisture	Actual Wet
TYPE	24.0 lb	1225.0 lb	1321.0 lb	+4.8%		
SAND	2590 lb	2432 lb	2432 lb	-0.6%		
WATER	47.0 gal	453.0 gal	453.0 gal	-0.6%		453.0 gal
Actual	Wet Batched					
Load Totals:	2927.0 lb	Design 2.724 Water/Cement 2.902		Design 423.0 gal	Actual 453.0 gal	To Add: 30.0 gal
Slump:	9.00 in	% Water in Truck 0.0 gal	Adjust Water: 0.0 gal	Load Trip Water: 4.0 gal	CYD	Note: Manual feed on

WEIGHMASTER SIGNATURE X

2600 N. Stadium Blvd.  
Columbia, MO 65202  
Dispatch - (573) 445-3901  
Office - (573) 446-0919

# Columbia READY MIX



THE DIFFERENCE IS IN THE SERVICE

<b>SOLD TO:</b> 5007 CON CASH CUSTOMER	<b>SHIP TO:</b> ELLIS FISCHER HUNT HAD SERVICES 156106
20003	

LOAD TIME	MIX #	LOAD SIZE	YARDS ORDERED	MIX TIME	TRUCK #	MIN. DELIVERY CHG.	TICKET #
9:33	1024	9.00	150.00		45		51605773
DATE	CODE #	LOAD #	YARDS DEL.	BATCH #	USAGE	SLUMP	TRANSACTION #
11/22/16		15	135.00	13330		8.00 in	12733

STADIUM TO BUS. LOOP L TO NORTH  
TO NORTH SIDE OF ELLIS FISCHER

**CONTRACTOR TO PROVIDE WASH OUT AREA**

**H<sub>2</sub>O Added By Request/Authorized By**  
GAL X

NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE, OWNER'S NOTICE, AND WILL BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE.

**LOAD RECEIVED BY**  
X

QUANTITY	CODE	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
9.00 yd	1024	CITY FLOWABLE FT	\$17.50	\$157.50

DELIVERY CHARGE \$207.00

**PROPERTY DAMAGE RELEASE**

(TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE) THE DRIVER OF THIS TRUCK IN PRESENTING THIS RELEASE TO YOU FOR YOUR SIGNATURE IS OF THE OPINION THAT THE SIZE AND WEIGHT OF HIS TRUCK MAY POSSIBLY CAUSE DAMAGE TO THE PREMISES AND/OR ADJACENT PROPERTY IF HE PLACES THE MATERIAL IN THIS LOAD WHERE YOU DESIRE IT. THE DRIVER IS REQUESTING THAT YOU SIGN THIS RELEASE RELIEVING HIM AND THIS SUPPLIER FROM ANY RESPONSIBILITY FROM ANY DAMAGE THAT MAY OCCUR TO THE PREMISES AND/OR ADJACENT PROPERTY, BUILDINGS, SIDEWALKS, DRIVEWAYS, CURBS, ETC., BY THE DELIVERY OF THIS MATERIAL.

SIGNED  
X

Additional Information on Reverse

Subtotal \$634.50  
Tax \$34.00

**GRAND TOTAL ▶ 10,028.05**

BATCH DATA	Driver	User	Disp	Ticket Num	Ticket	IX	Time	Date
45	2773	user	51605773	42733			9:32	11/22/16
Load Size	Code	Returned	Qt	Mix	Oge	Seq	Load	ID
9.00	CY15					0		13330
Material	Design Qty	Required	Received	% Var	% Moisture	Actual Wet		
TYPE1	144.0 lb	129.0 lb	129.0 lb	0.00%				
SAND	2694 lb	2425 lb	2410 lb	-0.50%				
WATER	47.0 gal	459.0 gal	459.0 gal	0.00%		459.0 gal		
Actual	Wet Batchest							
Load Total:	29286 lb	Design 2.724	Water/Cement 2	Design 423.0 gal	Actual 459.0 gal	To Add: 3.0 gal		
Slump:	8.00 in	# Water in Truck:	0.0 gal	Adjust	Water: 0.0 gal	/Load	True Water: 0.0 gal	CYG Note: Manual feed ok

**WEIGHMASTER SIGNATURE X**

2600 N. Stadium Blvd.  
Columbia, MO 65202  
Dispatch - (573) 445-3901  
Office - (573) 446-0919

# Columbia READY MIX

THE DIFFERENCE IS IN THE SERVICE



<b>SOLD TO:</b> 5807 CRN CAR CUSTOMER	<b>SHIP TO:</b> ELLIS FISCHEL HUNT VAC SERVICES 155106
30002	

LOADTIME	MIX #	LOAD SIZE	YARDS ORDERED	MIX TIME	TRUCK #	MIN. DELIVERY CHG.	TICKET #
9:33	1024	9.00	150.00		43		51605774
DATE	CODE #	LOAD #	YARDS DEL.	BATCH #	USAGE	SLUMP	TRANSACTION #
11/22/16		10	144.00	13071		8.00 in	12734

H<sub>2</sub>O Added By Request/Authorized By

GAL X

NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE, OWNER'S NOTICE, AND WILL BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE

LOAD RECEIVED BY

X

CONTRACTOR TO PROVIDE WASH OUT AREA

QUANTITY	CODE	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
9.00 yd.	1024	CITY FLOWABLE FI	\$47.50	\$427.50

DELIVERY CHARGE

**PROPERTY DAMAGE RELEASE**

(TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE) THE DRIVER OF THIS TRUCK IN PRESENTING THIS RELEASE TO YOU FOR YOUR SIGNATURE IS OF THE OPINION THAT THE SIZE AND WEIGHT OF HIS TRUCK MAY POSSIBLY CAUSE DAMAGE TO THE PREMISES AND/OR ADJACENT PROPERTY IF HE PLACES THE MATERIAL IN THIS LOAD WHERE YOU DESIRE IT. THE DRIVER IS REQUESTING THAT YOU SIGN THIS RELEASE RELIEVING HIM AND THIS SUPPLIER FROM ANY RESPONSIBILITY FROM ANY DAMAGE THAT MAY OCCUR TO THE PREMISES AND/OR ADJACENT PROPERTY, BUILDINGS, SIDEWALKS, DRIVEWAYS, CURBS, ETC., BY THE DELIVERY OF THIS MATERIAL.

SIGNED

X

Additional Information on Reverse

Subtotal 4534.00

Tax 834.00

**GRAND TOTAL** 10,697.44

BATCH DATA	Driver	User	Disp. Ticket Num	Ticket ID	Time	Date			
43	2037	User	51605774	12734	9:33	11/22/16			
Load Size	Mix Code	Returned	Qty	Mix Age	Seq	Load ID			
9.00	1024				0	13331			
Yards:	Design Qty	Required	Batched	Wet	% Moisture	Actual Wet			
Yards:	144.00	1290.0	1272.0	1.95%					
WATER	Design	Required	Batched						
WATER	47.0	459.0	459.0	0.00%		459.0			
Actual	Wet								
Load Total:	25302	15	Design 2.726	Water/Wetwt 3.011	4	Design 423.0	Actual 459.0	To Add: 0.0	
Slump:	8.00	in	Water in Trucks: 0.0	gl	Adjust Water: 0.0	gl	Load Trip Data: 0.0	gl/ CYD	Notes: Manual feed on

WEIGHMASTER SIGNATURE X

DELIVERY RECEIPT

2600 N. Stadium Blvd.  
Columbia, MO 65202  
Dispatch - (573) 445-3901  
Office - (573) 446-0919

# Columbia READY MIX

THE DIFFERENCE IS IN THE SERVICE



<b>SOLD TO:</b> 5007 CRN CASH CUSTOMER 20083	<b>SHIP TO:</b> ELLIS FISCHEL HUNT VAC SERVICES 136196
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LOAD TIME	MIX #	LOAD SIZE	YARDS ORDERED	MIX TIME	TRUCK #	MIN. DELIVERY CHG.	TICKET #
7:15	1024	0.00	100.00		57		51095756
DATE	CODE #	LOAD #	YARDS DEL	BATCH #	USAGE	SLUMP	TRANSACTION #
11/02/16			10.00	13313		0.00 in	10716

STADIUM TO BUS. LOOP L TO SOUTH TO NORTH SIDE OF ELLIS FISCHEL	<b>H<sub>2</sub>O Added By Request/Authorized By</b> _____ GAL X _____
NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE, OWNER'S NOTICE, AND WILL BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE.	
<b>LOAD RECEIVED BY</b> X _____	
<b>CONTRACTOR TO PROVIDE WASH OUT AREA</b>	

QUANTITY	CODE	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
100.00	1024	CITY READY MIX	\$47.50	\$4750.00
DELIVERY CHARGE			\$207.00	

<b>PROPERTY DAMAGE RELEASE</b> (TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE) THE DRIVER OF THIS TRUCK IN PRESENTING THIS RELEASE TO YOU FOR YOUR SIGNATURE IS OF THE OPINION THAT THE SIZE AND WEIGHT OF HIS TRUCK MAY POSSIBLY CAUSE DAMAGE TO THE PREMISES AND/OR ADJACENT PROPERTY IF HE PLACES THE MATERIAL IN THIS LOAD WHERE YOU DESIRE IT. THE DRIVER IS REQUESTING THAT YOU SIGN THIS RELEASE RELIEVING HIM AND THIS SUPPLIER FROM ANY RESPONSIBILITY FROM ANY DAMAGE THAT MAY OCCUR TO THE PREMISES AND/OR ADJACENT PROPERTY, BUILDINGS, SIDEWALKS, DRIVEWAYS, CURBS, ETC., BY THE DELIVERY OF THIS MATERIAL.	Subtotal \$634.50 Tax \$34.99
SIGNED X _____	<b>GRAND TOTAL</b> \$1,337.18
Additional Information on Reverse	

BATCH DATA	Driver	User	Disp Ticket	Max Ticket	YD	Time	Date
07	2011	user	51600756	10716		7:12	11/02/16
Load Size	Mix Code	Returned	Qty	Mix Qty	Qty	Load ID	
0.00	1024				0	13313	
Material	Design Qty	Required	Batched	Water	Slump	Actual Wet	
TRCP	10.00	1000.0 lb	1300.0 lb	0.00			
SAND	2553.16	24262.16	24100.16	-0.6%			
WATER	17.00	133.00	133.00	0.00		450.00	
Notes:	New Batched						
Load Total:	2920.16	Design 0.724	Water/Cement 2.937	Design 450.00	Actual 450.00	gl	To Add: 0.00
Slump:	0.00 in	Water in Truck:	0.00	Adjust Water:	0.00	gl	Load: This Water: 2.00
						gl	CVS (note: Manual feed is

WEIGHMASTER SIGNATURE X

2600 N. Stadium Blvd.  
 Columbia, MO 65202  
 Dispatch - (573) 445-3901  
 Office - (573) 446-0919

# Columbia READY MIX

THE DIFFERENCE IS IN THE SERVICE



<b>SOLD TO:</b> 3007 CRN CASH CUSTOMER	<b>SHIP TO:</b> ELLIS FISCHER HUNT VAC SERVICES 156186
20003	

LOAD TIME	MIX #	LOAD SIZE	YARDS ORDERED	MIX TIME	TRUCK #	MIN. DELIVERY CHG.	TICKET #
8:34	1024	9.00	150.00		67		51605765
DATE	CODE #	LOAD #	YARDS DEL.	BATCH #	USAGE	SLUMP	TRANSACTION #
11/22/10		10	90.00	13322		8.00	12725

STADIUM TO BUS. LOOP L TO GARTH  
 L TO NORTH SIDE OF ELLIS FISCHER.

H<sub>2</sub>O Added By Request/Authorized By  
 \_\_\_\_\_  
 GAL X \_\_\_\_\_

NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE, OWNER'S NOTICE, AND WILL BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE.

LOAD RECEIVED BY  
 X \_\_\_\_\_

CONTRACTOR TO PROVIDE WASH OUT AREA

QUANTITY	CODE	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
		CITY PLUMBING FEE	\$7.50	\$7.50
		DELIVERY CHARGE	\$207.00	\$207.00

**PROPERTY DAMAGE RELEASE**

(TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE) THE DRIVER OF THIS TRUCK IN PRESENTING THIS RELEASE TO YOU FOR YOUR SIGNATURE IS OF THE OPINION THAT THE SIZE AND WEIGHT OF HIS TRUCK MAY POSSIBLY CAUSE DAMAGE TO THE PREMISES AND/OR ADJACENT PROPERTY IF HE PLACES THE MATERIAL IN THIS LOAD WHERE YOU DESIRE IT. THE DRIVER IS REQUESTING THAT YOU SIGN THIS RELEASE RELIEVING HIM AND THIS SUPPLIER FROM ANY RESPONSIBILITY FROM ANY DAMAGE THAT MAY OCCUR TO THE PREMISES AND/OR ADJACENT PROPERTY, BUILDINGS, SIDEWALKS, DRIVEWAYS, CURBS, ETC., BY THE DELIVERY OF THIS MATERIAL.

SIGNED  
 X \_\_\_\_\_

Additional Information on Reverse

Subtotal 1634.50  
 Tax 234.29

**GRAND TOTAL** ▶ \$1,868.79

BATCH DATA	Driver	User	Qty	Ticket No	Ticket ID	Time	Date
67	2041	user		51605765	12725	8:33	11/22/10
Load Size	Mix Code	Returned	Qty	Mix Age	Seq	Load ID	
9.00	CY02 1024				0	13322	
Material	Design Qty	Required	Batched	% Var	% Moisture	Actual Wt	
TYPE	153.0 lb	1236.0 lb	1236.0 lb	0.00%			
SAND	1650 lb	24200 lb	24100 lb	-1.50%			
WATER	71.0 gal	459.0 gal	459.0 gal	0.00%		459.0 gal	
Ret. gal	100						
Load Totals:	39285 lb	Design 2.724	Water Content 2.556	A	Design 102.0 gal	Actual 150.0 gal	To Add: 0.0
Slump:	3.00 in	% Water in Truck: 0.0 gal	Adjust Water 0.0 gal		Load Trial Water: 0.0 gal	CYD	Water: Manual feed on

WEIGHMASTER SIGNATURE X \_\_\_\_\_

2600 N. Stadium Blvd.  
 Columbia, MO 65202  
 Dispatch - (573) 445-3901  
 Office - (573) 446-0919

# Columbia READY MIX

THE DIFFERENCE IS IN THE SERVICE



**SOLD TO:**  
 5807  
 CPM CASH CUSTOMER

**SHIP TO:**  
 ELLIS FISCHER HUNT VAC SERVICES  
 150186  
 20003

LOAD TIME	MIX #	LOAD SIZE	YARDS ORDERED	MIX TIME	TRUCK #	MIN. DELIVERY CHG.	TICKET #
8:22	1024	3.00	150.00		45		51603763
DATE	CODE #	LOAD #	YARDS DEL.	BATCH #	USAGE	SLUMP	TRANSACTION #
11/20/10		8	72.00	13320		6.00	12723

STATION TO BUS. LOOP 1. TO GARTH  
 IL TO NORTH SIDE OF ELLIS FISCHER

CONTRACTOR TO PROVIDE WASH OUT AREA.

**H<sub>2</sub>O Added By Request/Authorized By**  
 \_\_\_\_\_  
 GAL X \_\_\_\_\_

NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE, OWNER'S NOTICE, AND WILL BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE.

**LOAD RECEIVED BY**  
 X \_\_\_\_\_

QUANTITY	CODE	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
150.00	1024	CITY FLOWABLE PAV	\$47.50	\$7,125.00

DELIVERY CHARGE \$207.00

**PROPERTY DAMAGE RELEASE**

(TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE) THE DRIVER OF THIS TRUCK IN PRESENTING THIS RELEASE TO YOU FOR YOUR SIGNATURE IS OF THE OPINION THAT THE SIZE AND WEIGHT OF HIS TRUCK MAY POSSIBLY CAUSE DAMAGE TO THE PREMISES AND/OR ADJACENT PROPERTY IF HE PLACES THE MATERIAL IN THIS LOAD WHERE YOU DESIRE IT. THE DRIVER IS REQUESTING THAT YOU SIGN THIS RELEASE RELIEVING HIM AND THIS SUPPLIER FROM ANY RESPONSIBILITY FROM ANY DAMAGE THAT MAY OCCUR TO THE PREMISES AND/OR ADJACENT PROPERTY, BUILDINGS, SIDEWALKS, DRIVEWAYS, CURBS, ETC., BY THE DELIVERY OF THIS MATERIAL.

SIGNED  
 X \_\_\_\_\_

Additional Information on Reverse

Subtotal: 1634.00  
 Tax: 324.09

**GRAND TOTAL** ▶ \$5,340.72

BATCH DATA	Driver	User	Disp Ticket No	Ticket ID	Time	Date
45	0783	user	51603763	12723	8:21	11/20/10
Load Size	Mix Code	Returned	Mix Age	Seq	Load ID	
3.00	CVBS 1024			8	13320	
Material	Design Mix	Required	Batched	% Inc	% Moisture	Actual Mat
TRPG	1.0 lb	1390.0 lb	1390.0 lb	-0.00%		
SGG	200 lb	2000.0 lb	2000.0 lb	-0.00%		
SPTR	45.0 gal	450.0 gal	450.0 gal	0.00%		450.0 gal
Actual	Mix Batched:	1				
Load Total:	51278 lb	Design 2.34	Water/Trock 2.57%	Design 423.0 gal	Actual 450.0 gal	No Add: 0.0 gal
Slump: 6.00 in	Water in Trucks: 0.9 gal	Adjust Water: 0.6 gal	Load Total Water: 0.8 gal	SPR	Metal: Manual Feed ac	

WEIGHMASTER SIGNATURE X

2600 N. Stadium Blvd.  
 Columbia, MO 65202  
 Dispatch - (573) 445-3901  
 Office - (573) 446-0919

DELIVERY RECEIPT

# Columbia READY MIX

THE DIFFERENCE IS IN THE SERVICE



<b>SOLD TO:</b> 5067 CRY CASH CUSTOMER	<b>SHIP TO:</b> ELLIS FISCHEL HUNT VAC SERVICES 156106
--	--

LOAD TIME	MIX #	LOAD SIZE	YARDS ORDERED	MIX TIME	TRUCK #	MIN. DELIVERY CHG.	TICKET #
9:54	1024	9.00	100.00		101		51605767
DATE	CODE #	LOAD #	YARDS DEL.	BATCH #	USAGE	SLUMP	TRANSACTION #
11/28/16		12	100.00	13304		8.00 in	12727

STADIUM TO BUS. LOOP 1 TO SOUTH  
 TO NORTH SIDE OF ELLIS FISCHEL

**CONTRACTOR TO PROVIDE WASH OUT AREA**

**H<sub>2</sub>O Added By Request/Authorized By**

GAL X

NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE, OWNER'S NOTICE, AND WILL BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE.

LOAD RECEIVED BY

X

QUANTITY	CODE	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
9.00	1024	CITY FLOWABLE PI	\$47.50	\$427.50

DELIVERY CHARGE \$207.00

**PROPERTY DAMAGE RELEASE**

(TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE) THE DRIVER OF THIS TRUCK IN PRESENTING THIS RELEASE TO YOU FOR YOUR SIGNATURE IS OF THE OPINION THAT THE SIZE AND WEIGHT OF HIS TRUCK MAY POSSIBLY CAUSE DAMAGE TO THE PREMISES AND/OR ADJACENT PROPERTY IF HE PLACES THE MATERIAL IN THIS LOAD WHERE YOU DESIRE IT. THE DRIVER IS REQUESTING THAT YOU SIGN THIS RELEASE RELIEVING HIM AND HIS SUPPLIER FROM ANY RESPONSIBILITY FROM ANY DAMAGE THAT MAY OCCUR TO THE PREMISES AND/OR ADJACENT PROPERTY, BUILDINGS, SIDEWALKS, DRIVEWAYS, CURBS, ETC., BY THE DELIVERY OF THIS MATERIAL.

SIGNED

X

**Additional Information on Reverse**

Subtotal 1634.50  
 Tax 134.00

**GRAND TOTAL** \$1,823.00

BATCH DATA	Driver	User	Disp	Ticket Num	Ticket ID	Time	Date
101	11	user	51605767		12727	8:55	11/28/16
Load Size	Mix Code	Returned	Qty	Mix Age	Seq	Load ID	
9.00	CYBS 1024				0	13324	
Material	Design Qty	Required	Batched	% Var	% Moisture	Actual Wat	
WGT	143.0 lb	1295.0 lb	1295.0 lb	0.00%			
SAND	3698 lb	24282 lb	24282 lb	-0.35%			
WATER	47.0 gal	459.0 gal	459.0 gal	0.00%		459.0 gal	
Actual	Wet Batches:		1				
Load Total:	29126 lb	Design 2.720	Water/Cement 2.955	A	Design 23.0 gal	Actual 459.0 gal	To Add: 0.0 gal
Slump:	8.00 in	Water in Truck: 0.0 gal	Adjust Water: 0.0 gal	/ Load	Total Water: 0.0 gal	CYB	Note: Manual feed ok

WEIGHMASTER SIGNATURE X



2600 N. Stadium Blvd.  
Columbia, MO 65202  
Dispatch - (573) 445-3901  
Office - (573) 446-0919

# Columbia READY MIX

THE DIFFERENCE IS IN THE SERVICE



<b>SOLD TO:</b> 3007 CON CASH CUSTOMER	<b>SHIP TO:</b> ELLIS FISCHEL HUNT PAC SERVICES 155186
--	--

LOAD TIME	MIX #	LOAD SIZE	YARDS ORDERED	MIX TIME	TRUCK #	MIN. DELIVERY CHG.	TICKET #
7:55	1024	3.00	150.00		117		51503755
DATE	CODE #	LOAD #	YARDS DEL.	BATCH #	USAGE	SLUMP	TRANSACTION #
11/22/06		5	45.00	13316		8.00	12719

STADIUM TO BUS LOOP E TO GARTH & TO NORTH SIDE OF ELLIS FISCHEL	<b>H<sub>2</sub>O Added By Request/Authorized By</b> _____ GAL X _____
CONTRACTOR TO PROVIDE WASH OUT AREA	
NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE, OWNER'S NOTICE, AND WILL BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE.	
LOAD RECEIVED BY X _____	

QUANTITY	CODE	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
150.00	1024	CONCRETE	\$2.82	\$423.00
				DELIVERY CHARGE \$207.00

<b>PROPERTY DAMAGE RELEASE</b> (TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE) THE DRIVER OF THIS TRUCK IN PRESENTING THIS RELEASE TO YOU FOR YOUR SIGNATURE IS OF THE OPINION THAT THE SIZE AND WEIGHT OF HIS TRUCK MAY POSSIBLY CAUSE DAMAGE TO THE PREMISES AND/OR ADJACENT PROPERTY IF HE PLACES THE MATERIAL IN THIS LOAD WHERE YOU DESIRE IT. THE DRIVER IS REQUESTING THAT YOU SIGN THIS RELEASE RELIEVING HIM AND THIS SUPPLIER FROM ANY RESPONSIBILITY FROM ANY DAMAGE THAT MAY OCCUR TO THE PREMISES AND/OR ADJACENT PROPERTY, BUILDINGS, SIDEWALKS, DRIVEWAYS, CURBS, ETC., BY THE DELIVERY OF THIS MATERIAL.	Subtotal 1034.50 Tax 234.95
SIGNED X _____	<b>GRAND TOTAL</b> ▶ \$3,342.95

BATCH DATA	Driver	User	Disp. Ticket Num	Ticket ID	Time	Date	
117	295	user	51603755	12719	7:55	11/22/06	
Load Size	Mix Code	Returned	Qty	Mix Age	Seg	Load ID	
3.00 CYDS	1024				5	13316	
Material	Design Qty	Required	Batched	% Wt	# Moisture	Actual Net	
TRK	141.0 lb	1035.0 lb	1255.0 lb	8.75%			
SPG	2670 lb	2432.0 lb	2410.0 lb	-2.58%			
WATER	47.0 gal	459.0 gal	459.0 gal	0.00%		459.0 gal	
Subst:	See Batched:						
Load Total:	2926 lb	Design 2.704	Actual 2.956	0	Design 123.0 gal	Actual 159.0 gal	
Slump:	8.00 in	Water in Truck:	0.0 gal	Adjust Water:	0.0 gal	Load Total Water:	0.0 gal

WEIGHMASTER SIGNATURE X \_\_\_\_\_

2600 N. Stadium Blvd.  
 Columbia, MO 65202  
 Dispatch - (573) 445-3901  
 Office - (573) 446-0919

# Columbia READY MIX

THE DIFFERENCE IS IN THE SERVICE



<b>SOLD TO:</b> 5907 CRI CASI CUSTOMER	<b>SHIP TO:</b> ELLIS FISCHEL HUNT VAC SERVICES 056185
--	--

LOAD TIME	MIX #	LOAD SIZE	YARDS ORDERED	MIX TIME	TRUCK #	MIN. DELIVERY CHG.	TICKET #
9:10	1024	9.00	450.00		112		5160576
DATE	CODE #	LOAD #	YARDS DEL.	BATCH #	USAGE	SLUMP	TRANSACTION #
11/22/16			54.00	13810		8.00	12721

STADIUM TO BUS. LOOP 1 TO SOUTH TO NORTH SIDE OF ELLIS FISCHEL	<b>H<sub>2</sub>O Added By Request/Authorized By</b> _____ GAL X _____
<b>CONTRACTOR TO PROVIDE WASH OUT AREA</b>	
NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE, OWNER'S NOTICE, AND WILL BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE.	
LOAD RECEIVED BY X _____	

QUANTITY	CODE	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
450.00	1024	CITY FLOWABLE	\$17.50	\$787.50
			DELIVERY CHARGE	\$207.00

<b>PROPERTY DAMAGE RELEASE</b> (TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE) THE DRIVER OF THIS TRUCK IN PRESENTING THIS RELEASE TO YOU FOR YOUR SIGNATURE IS OF THE OPINION THAT THE SIZE AND WEIGHT OF HIS TRUCK MAY POSSIBLY CAUSE DAMAGE TO THE PREMISES AND/OR ADJACENT PROPERTY IF HE PLACES THE MATERIAL IN THIS LOAD WHERE YOU DESIRE IT. THE DRIVER IS REQUESTING THAT YOU SIGN THIS RELEASE RELIEVING HIM AND THIS SUPPLIER FROM ANY RESPONSIBILITY FROM ANY DAMAGE THAT MAY OCCUR TO THE PREMISES AND/OR ADJACENT PROPERTY, BUILDINGS, SIDEWALKS, DRIVEWAYS, CURBS, ETC., BY THE DELIVERY OF THIS MATERIAL.	Subtotal \$634.50 Tax \$34.99
SIGNED X _____	<b>GRAND TOTAL</b> ▶ \$4,011.50

Additional Information on Reverse									
BATCH DATA	Driver	User	Disp. Ticket Num	Ticket ID	Time	Date	Load Size	Mix Code	Returned
112	ELM	user	51605761	12721	9:09	11/22/16	9.00	1024	
Subtotal	Destn. Qty	Required	Batched	% Moisture	Actual Wat				
TYRES	147.0 lb	1090.0 lb	1320.0 lb	1.85					
SAND	2690 lb	24200 lb	24240 lb	0.00					
WATER	47.8 gal	459.0 gal	459.8 gal	0.00	459.0 gal				

2600 N. Stadium Blvd.  
 Columbia, MO 65202  
 Dispatch - (573) 445-3901  
 Office - (573) 446-0919

# Columbia READY MIX

THE DIFFERENCE IS IN THE SERVICE



**SOLD TO:**

3027  
 CPM CASH CUSTOMER

**SHIP TO:**

ELI IS FISCHEL HUNT VAC SERVICES

156186

20003

LOAD TIME	MIX #	LOAD SIZE	YARDS ORDERED	MIX TIME	TRUCK #	MIN. DELIVERY CHG.	TICKET #
7:33	1024	3.00	150.00		115		51605758
DATE	CODE #	LOAD #	YARDS DEL.	BATCH #	USAGE	SLUMP	TRANSACTION #
11/22/10		1	36.00	13315		3.00	13718

STADIUM TO BUS. LOOP L TO BARTH  
 TO NORTH SIDE OF ELLIS FISCHEL

**H<sub>2</sub>O Added By Request/Authorized By**

GAL X

NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE, OWNER'S NOTICE, AND WILL BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE.

LOAD RECEIVED BY

CONTRACTOR TO PROVIDE WASH OUT AREA

X

QUANTITY	CODE	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
		CITY FLOWABLE FT	147.50	147.50

DELIVERY CHARGE 1207.00

**PROPERTY DAMAGE RELEASE**

(TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE) THE DRIVER OF THIS TRUCK IN PRESENTING THIS RELEASE TO YOU FOR YOUR SIGNATURE IS OF THE OPINION THAT THE SIZE AND WEIGHT OF HIS TRUCK MAY POSSIBLY CAUSE DAMAGE TO THE PREMISES AND/OR ADJACENT PROPERTY IF HE PLACES THE MATERIAL IN THIS LOAD WHERE YOU DESIRE IT. THE DRIVER IS REQUESTING THAT YOU SIGN THIS RELEASE RELIEVING HIM AND THIS SUPPLIER FROM ANY RESPONSIBILITY FROM ANY DAMAGE THAT MAY OCCUR TO THE PREMISES AND/OR ADJACENT PROPERTY, BUILDINGS, SIDEWALKS, DRIVEWAYS, CURBS, ETC., BY THE DELIVERY OF THIS MATERIAL.

SIGNED

X \_\_\_\_\_

Additional Information on Reverse

Subtotal 5634.50

Tax 134.00

**GRAND TOTAL** 5768.50

BATCH DATA	Driver	User	Disp	Ticket Num	Ticket ID	Time	Date
115	173	user		51605758	13718	7:33	11/22/10
Load Size	Mix Code	Returned	Qty	Mix Qty	Seq	Load ID	
3.00	CYDS 1024				5	13315	
Material	Design Qty	Required	Batched	Wt	Wt	Actual Wt	
TYPES	14.8 lb	1295.0 lb	1280.0 lb	-0.50%			
SPHD	2500 lb	2420.0 lb	2410.0 lb	-0.50%			
WATER	47.0 gal	459.0 gal	459.0 gal	0.00%		459.0 gal	
Actual	New Batches:						
Load Total:	20270 lb	Design 2.724	Water/Cement 2.974		Design 423.0 gal	Actual 459.0 gal	To Add: 0.0 gal
Slump:	3.20 in	Water in Truck: 0.0 gal	Adjust Water: 0.0 gal		Load Total Water: 0.0 gal	CYD Water: Manual feed ok	

WEIGHMASTER SIGNATURE X

DELIVERY TICKET

2600 N. Stadium Blvd.  
Columbia, MO 65202  
Dispatch - (573) 445-3901  
Office - (573) 446-0919

# Columbia READY MIX

THE DIFFERENCE IS IN THE SERVICE



**SOLD TO:**

5007  
CRM CASH CUSTOMER

**SHIP TO:**

ELLIS FISCHER HUNT VAC SERVICES

156186

20003

LOAD TIME	MIX #	LOAD SIZE	YARDS ORDERED	MIX TIME	TRUCK #	MIN. DELIVERY CHG.	TICKET #
7:33	1024	9.00	150.00		115		51605758
DATE	CODE #	LOAD #	YARDS DEL.	BATCH #	USAGE	SLUMP	TRANSACTION #
11/22/16		4	36.00	10315		8.00 in	12710

STADIUM TO BUS. LOOP L TO GARTH  
L TO NORTH SIDE OF ELLIS FISCHER

**H<sub>2</sub>O Added By Request/Authorized By**

\_\_\_\_\_ GAL X \_\_\_\_\_

**NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE, OWNER'S NOTICE, AND WILL BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE.**

LOAD RECEIVED BY

X

**CONTRACTOR TO PROVIDE WASH OUT AREA**

QUANTITY	CODE	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
9.00 yd	1024	CITY FLOWABLE FI	\$47.50	\$427.50

DELIVERY CHARGE \$207.00

**PROPERTY DAMAGE RELEASE**

(TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE) THE DRIVER OF THIS TRUCK IN PRESENTING THIS RELEASE TO YOU FOR YOUR SIGNATURE IS OF THE OPINION THAT THE SIZE AND WEIGHT OF HIS TRUCK MAY POSSIBLY CAUSE DAMAGE TO THE PREMISES AND/OR ADJACENT PROPERTY IF HE PLACES THE MATERIAL IN THIS LOAD WHERE YOU DESIRE IT. THE DRIVER IS REQUESTING THAT YOU SIGN THIS RELEASE RELIEVING HIM AND THIS SUPPLIER FROM ANY RESPONSIBILITY FROM ANY DAMAGE THAT MAY OCCUR TO THE PREMISES AND/OR ADJACENT PROPERTY, BUILDINGS, SIDEWALKS, DRIVEWAYS, CURBS, ETC., BY THE DELIVERY OF THIS MATERIAL.

SIGNED

X \_\_\_\_\_

**Additional Information on Reverse**

Subtotal \$634.50

Tax \$34.09

**GRAND TOTAL** ▶ \$2,674.36

BATCH/DATE	Driver	User	Disp Ticket Num	Ticket ID	Time	Date
115	175	user	51605758	12718	7:31	11/22/16
Load Size	Mix Code	Returned	Qty	Mix Age	Seq	Load ID
9.00 CYDS	1024				D	13315
Material	Design Qty	Required	Batched	% Var	% Moisture	Actual Wat
TYPE1	144.0 lb	1296.0 lb	1280.0 lb	-0.62%		
SAND	2698 lb	24282 lb	24160 lb	-0.50%		
WATER	47.0 gl	459.0 gl	459.0 gl	0.00%		459.0 gl
Actual	Num Batches: 1					
Load Total:	29278 lb	Design 2.724	Water/Cement 2.974 A	Design 423.0 gl	Actual 459.0 gl	To Add: 0.0 gl
Slump:	8.00 in	# Water in Truck: 0.0 gl	Adjust Water: 0.0 gl	/ Load Trim Water: 0.0 gl/	CYD	Note: Manual feed oc

WEIGHMASTER SIGNATURE X \_\_\_\_\_

DELIVERY TICKET

2600 N. Stadium Blvd.  
Columbia, MO 65202  
Dispatch - (573) 445-3901  
Office - (573) 446-0919

# Columbia READY MIX

THE DIFFERENCE IS IN THE SERVICE



**SOLD TO:**

5007  
CRM CASH CUSTOMER

**SHIP TO:**

ELLIS FISCHER HUNT VAC SERVICES  
156186

20003

LOAD TIME	MIX #	LOAD SIZE	YARDS ORDERED	MIX TIME	TRUCK #	MIN. DELIVERY CHG.	TICKET #
8:28	1024	9.00	150.00		43		51605764
DATE	CODE #	LOAD #	YARDS DEL.	BATCH #	USAGE	SLUMP	TRANSACTION #
11/22/16		9	81.00	13321		8.00 in	12724

STADIUM TO BUS. LOOP L TO GARTH  
L TO NORTH SIDE OF ELLIS FISCHER

**H<sub>2</sub>O Added By Request/Authorized By**

\_\_\_\_\_ GAL X \_\_\_\_\_

**NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE, OWNER'S NOTICE, AND WILL BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE.**

LOAD RECEIVED BY

X \_\_\_\_\_

**CONTRACTOR TO PROVIDE WASH OUT AREA**

QUANTITY	CODE	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
9.00 yd	1024	CITY FLOWABLE FI	\$47.50	\$427.50

DELIVERY CHARGE \$207.00

**PROPERTY DAMAGE RELEASE**

(TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE) THE DRIVER OF THIS TRUCK IN PRESENTING THIS RELEASE TO YOU FOR YOUR SIGNATURE IS OF THE OPINION THAT THE SIZE AND WEIGHT OF HIS TRUCK MAY POSSIBLY CAUSE DAMAGE TO THE PREMISES AND/OR ADJACENT PROPERTY IF HE PLACES THE MATERIAL IN THIS LOAD WHERE YOU DESIRE IT. THE DRIVER IS REQUESTING THAT YOU SIGN THIS RELEASE RELIEVING HIM AND THIS SUPPLIER FROM ANY RESPONSIBILITY FROM ANY DAMAGE THAT MAY OCCUR TO THE PREMISES AND/OR ADJACENT PROPERTY, BUILDINGS, SIDEWALKS, DRIVEWAYS, CURBS, ETC., BY THE DELIVERY OF THIS MATERIAL.

SIGNED

X \_\_\_\_\_

Subtotal \$634.50

Tax \$34.09

**Additional Information on Reverse**

**GRAND TOTAL** ▶ \$6,017.31

BATCH DATA	Driver	User	Disp Ticket Num	Ticket ID	Time	Date
43	2839	user	51605764	12724	8:28	11/22/16
Load Size	Mix Code	Returned	Qty	Mix Age	Seq	Load ID
9.00	CYDS 1024				D	13321
Material	Design Qty	Required	Batched	% Var	% Moisture	Actual Wat
TYPE1	144.0 lb	1376.0 lb	1304.0 lb	0.02%		
SAND	2699 lb	24282 lb	24200 lb	-0.34%		
WATER	47.0 gal	459.0 gal	459.0 gal	0.00%		459.0 gal
Actual	Non Batches: 1					
Load Totals:	2923% lb	Design 2.724	Water/Cement 2.937 A	Design 423.0 gal	Actual 459.0 gal	To Add: 0.0 gal
Slump:	8.00 in	# Water in Trucks: 0.0 gal	Adjust Water: 0.0 gal	/ Load	Tris Water: 0.0 gal / CYD	Water Manual feed or

WEIGHMASTER SIGNATURE X \_\_\_\_\_

**APPENDIX H**  
**CLEANFILL AND LANDFILL TICKET**

CITY OF COLUMBIA  
 P O Box 6015 - 5700 Peabody  
 Columbia, MO 65205

035045 4 1 CONTAINERS  
 1495 OLD US HWY 48  
 COLUMBIA MO 65202

03 / 20100203 CS 3M1  
 DATE IN DATE OUT TIME IN TIME OUT VEHICLE ROLL OFF  
 11/23/16 11/23/16 18:39 18:58 248319

REFERENCE ORIGIN  
 05-2830 COLUMBIA

Scale 1 Gross wt. 68848 LB  
 Scale 2 Tare wt. 32380 LB  
 Net Weight 28540 LB

UNIT	DESCRIPTION	RATE	EXTENSION	FEE	TOTAL
14.27	TON DEMOLITION-CLEAN	45.760	653.00	0.00	653.00

NET AMOUNT  
 653.00  
 16568.00  
 CHARGE  
 CHECK NO

VEHICLES ENTERING THE LANDFILL ARE SUBJECT TO A RANDOM INSPECTION. RATES: TRASH: \$45.76/TON, \$28.00 Minimum HOURS: 7AM-4PM MON-FRI; 8AM-2PM SAT. CLOSED SUN.

FOR ORDER ONLY. PLEASE WRITE TO: CITY OF COLUMBIA, MISSOURI, SIGNATURE

Phone: 573-474-8378  
Fax: 573-474-8493

Date 11/22/10

Name John Haja  
Address Ellis Federal Hospital  
City, State Zip Ill Mo

Driver Vol Cash  Credit Card  Bill  Check #  P.O. #

QUANTITY	DESCRIPTION	PRICE	AMOUNT
1			
2	10 yds Top Soil		
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			

RECEIVED BY \_\_\_\_\_

KEEP THIS SLIP FOR REFERENCE



**APPENDIX I**  
**BORING LOGS**



16252 Westwoods Business Park Dr  
 Ellisville, MO 63021  
 (636) 256-7200 | Fax (636) 256-7202  
 www.syaeng.com

ENVIRONMENTAL ENGINEERS  
 A Trinity Consultants Company

LOG OF TEST BORING

Client: University of Missouri		Project N: 162602.0219		Boring / Well No. PH 01					
Project: Mizzou North UST In-Place Closure				Page No. 1 of 2					
Location: Mizzou North				Start Date: 12/1/16					
Surface Elevation:		Top of Casing Elevation:		Completion Date: 12/1/16					
Drilling Contractor: Geodrill				Sample Method: Direct push					
Drill Rig: Powerprobe 9500									
Water Encountered ? : NO		Total Boring Depth: 24'		Hole Diameter: 2 inch					
Initial Water Level:		Surface Casing Depth: -		Inspector(s): DA					
Static Water Level:		Well Depth:		Company: Schreiber, Yonley & Associates					
Depth BGS (ft.)	Sample Interval	N	Rec. % RQD	PID Units	Description of Materials/Remarks	Moisture	Soil Class	Graphic Log	Well Diag.
1					Brown silty loam				
2	1		50	0.0					
3									
4									
5					Gravel				
6	2		25	0.0					
7									
8									
9					Gravel				
10	3		25	0.0					
11									
12									
13					Gravel, moist				
14	4		25	0.0					
15									
16									
17					Gravel				
18	5		25	0.0					
19									
20									
Notes:									



16252 Westwoods Business Park Dr  
Ellisville, MO 63021  
(636) 256-7200 | Fax (636) 256-7202  
www.syaeng.com

**LOG OF TEST BORING**

Client: University of Missouri		Project No: 162602.0219		Boring / Well No. <b>PH 01</b>	
Project: Mizzou North UST In-Place Closure				Page No. 2 of 2	
Location: Mizzou North			Start Date: 12/1/2016		
Surface Elevation:		Top of Casing Elevation:		Completion Date: 12/1/2016	
Drilling Contractor: Geodrill			Sample Method: Direct Push		
Drill Rig: Powerprobe 9500					
Water Encountered ? : NO		Total Boring Depth: <b>24</b>		Hole Diameter: 2 inch	
Initial Water Level:		Surface Casing Depth: -		Inspector(s): DA	
Static Water Level:		Well Depth:		Company: Schreiber, Yonley & Associates	

Depth BGS (ft.)	Sample Interval	N	Rec. % RQD	PID Units	Description of Materials/Remarks	Moisture	Soil Class	Graphic Log	Well Diag.
21	6		75	0.0	Brown clay w/ sand				
22					sample collected @ 20-21'				
23					PH 01 20-21'				
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									

Notes:



16252 Westwoods Business Park Dr  
 Ellitsville, MO 63021  
 (636) 256-7200 | Fax (636) 256-7202  
 www.syaeng.com

LOG OF TEST BORING

Client: University of Missouri		Project No: 162602.0219		Boring / Well No. PH02					
Project: Mizzou North UST In-Place Closure				Page No. 1 of 2					
Location: Mizzou North			Start Date: 12/1/16						
Surface Elevation:		Top of Casing Elevation:		Completion Date: 12/1/16					
Drilling Contractor: Geodrill			Sample Method: Direct push						
Drill Rig: Powerprobe 9500									
Water Encountered ? : NO		Total Boring Depth: 22'		Hole Diameter: 2 inch					
Initial Water Level:		Surface Casing Depth: -		Inspector(s): DA					
Static Water Level:		Well Depth:		Company: Schreiber, Yonley & Associates					
Depth BGS (ft.)	Sample Interval	N	Rec. % RQD	PID Units	Description of Materials/Remarks	Moisture	Soil Class	Graphic Log	Well Diag.
1					1.5' Brown silty loam				
2	1		50	0.0	6" Gravel				
3									
4									
5					Gravel				
6	2		25	0.0					
7									
8									
9					Gravel				
10	3		25	0.0					
11									
12									
13					Gravel, moist				
14	4		25	0.0					
15									
16									
17					8" Gravel				
18	5		25	0.0	4" Greenish tan silty clay,				
19					moist.				
20									
Notes:									



16252 Westwoods Business Park Dr  
 Ellisville, MO 63021  
 (636) 256-7200 | Fax (636) 256-7202  
 www.syaeng.com

ENVIRONMENTAL ENGINEERS  
 A Trinity Consultants Company

LOG OF TEST BORING

Client: University of Missouri		Project No: 162602.0219		Boring / Well No. PH 02	
Project: Mizzou North UST In-Place Closure				Page No. 2 of 2	
Location: Mizzou North			Start Date: 12/1/2016		
Surface Elevation:		Top of Casing Elevation:		Completion Date: 12/1/2016	
Drilling Contractor: Geodrill			Sample Method: Direct Push		
Drill Rig: Powerprobe 9500					
Water Encountered? : NO		Total Boring Depth:		Hole Diameter: 2 inch	
Initial Water Level:		Surface Casing Depth: -		Inspector(s): DA	
Static Water Level:		Well Depth:		Company: Schreiber, Yonley & Associates	

Depth BGS (ft.)	Sample Interval	N	Rec. % RQD	PID Units	Description of Materials/Remarks	Moisture	Soil Class	Graphic Log	Well Diag.
21	6		100	0.0	16. Brown silty clay w/ pebbles. sample collected at 20-21'				
22					PH 02 20-21'				
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									

Notes:



16252 Westwoods Business Park Dr  
 Ellisville, MO 63021  
 (636) 256-7200 | Fax (636) 256-7202  
 www.syaeng.com

ENVIRONMENTAL ENGINEERS  
 A Trinity Consultants Company

LOG OF TEST BORING

Client: University of Missouri		Project No: 162602.0219		Boring / Well No. PH 03					
Project: Mizzou North UST In-Place Closure				Page No. 1 of 1					
Location: Mizzou North				Start Date: 12/1/16					
Surface Elevation:		Top of Casing Elevation:		Completion Date: 12/1/16					
Drilling Contractor: Geodrill				Sample Method: Direct push					
Drill Rig: Powerprobe 9500									
Water Encountered ? : NO		Total Boring Depth: 8		Hole Diameter: 2 inch					
Initial Water Level:		Surface Casing Depth: -		Inspector(s): DA					
Static Water Level:		Well Depth:		Company: Schreiber, Yonley & Associates					
Depth BGS (ft.)	Sample Interval	N	Rec. % RQD	PID Units	Description of Materials/Remarks	Moisture	Soil Class	Graphic Log	Well Diag.
1					4" concrete				
2	1		2.5	0.0	6" Brown silty clay				
3									
4									
5	2		2.5	0.0	Gravel Probe refusal @ 8' No sample collected				
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

Notes:



16252 Westwoods Business Park Dr  
 Ellisville, MO 63021  
 (636) 256-7200 | Fax (636) 256-7202  
 www.syaeng.com

ENVIRONMENTAL ENGINEERS  
 A Trinity Consultants Company

LOG OF TEST BORING

Client: University of Missouri	Project No: 162602.0219	Boring / Well No. PH 04
Project: Mizzou North UST In-Place Closure		Page No. 1 of 1
Location: Mizzou North		Start Date: 12/1/16
Surface Elevation:	Top of Casing Elevation:	Completion Date: 12/1/16
Drilling Contractor: Geodrill		Sample Method: Direct push
Drill Rig: Powerprobe 9500		
Water Encountered ? : NO		Total Boring Depth: 18'
Initial Water Level:		Surface Casing Depth: -
Static Water Level:		Well Depth:
		Hole Diameter: 2 inch
		Inspector(s): DA
		Company: Schreiber, Yonley & Associates

Depth BGS (ft.)	Sample Interval	N	Rec. % RQD	PID Units	Description of Materials/Remarks	Moisture	Soil Class	Graphic Log	Well Diag.
1					4" concrete				
2			50		4" Brown silty sand				
3	1				16" Gravel				
4									
5					Gravel				
6	2		25						
7									
8									
9					Gravel				
10	3		25						
11									
12									
13					Gravel				
14	4		25						
15									
16									
17	5		50		Gravel, moist sample collected 12-16'				
18					PH 04 12-18'				
19					Probe refusal @ 18'				
20									

Notes:



16252 Westwoods Business Park Dr  
Ellisville, MO 63021  
(636) 256-7200 | Fax (636) 256-7202  
www.syaeng.com

LOG OF TEST BORING

Client: University of Missouri	Project N: 162602.0219	Boring / Well No. PH 05
Project: Mizzou North UST In-Place Closure		Page No. 1 of 2
Location: Mizzou North		Start Date: 12/1/16
Surface Elevation:	Top of Casing Elevation:	Completion Date: 12/1/16
Drilling Contractor: Geodrill		Sample Method: Direct push
Drill Rig: Powerprobe 9500		
Water Encountered ? : NO		Total Boring Depth: 22
Initial Water Level:		Surface Casing Depth: -
Static Water Level:		Well Depth:
		Hole Diameter: 2 inch
		Inspector(s): DA
		Company: Schreiber, Yonley & Associates

Depth BGS (ft.)	Sample Interval	N	Rec. % RQD	PID Units	Description of Materials/Remarks	Moisture	Soil Class	Graphic Log	Well Diag.
1					1' brown silty loam				
2	1		50	0.0	1' Gravel				
3									
4									
5									
6	2		25	0.0	Gravel				
7									
8									
9									
10	3		25	0.0	Gravel				
11									
12									
13									
14	4		25	0.0	Gravel, moist				
15									
16									
17									
18	5				3' sand				
19			100	0.0	1' light brown, gray mottled sandy clay				
20									

Notes:





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LOG OF TEST BORING

Client: University of Missouri					Project No: 162602.0219		Boring / Well No. <b>PH 05</b>			
Project: Mizzou North UST In-Place Closure							Page No. 2 of 2			
Location: Mizzou North							Start Date: 12/1/2016			
Surface Elevation:			Top of Casing Elevation:			Completion Date: 12/1/2016				
Drilling Contractor: Geodrill							Sample Method: Direct Push			
Drill Rig: Powerprobe 9500										
Water Encountered ? : NO					Total Boring Depth: <b>22</b>		Hole Diameter: 2 inch			
Initial Water Level:					Surface Casing Depth: -		Inspector(s): DA			
Static Water Level:					Well Depth:		Company: Schreiber, Yonley & Associates			
Depth BGS (ft.)	Sample Interval	N	Rec. % RQD	PID Units	Description of Materials/Remarks	Moisture	Soil Class	Graphic Log	Well Diag.	
21	So		100	0.0	lt. brown, grey mottled sandy clay Sample @ 20-21' PH 05 20-21'					
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
Notes:										



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LOG OF TEST BORING

Client: University of Missouri	Project No: 162602.0219	Boring / Well No. PH06
Project: Mizzou North UST In-Place Closure		Page No. 1 of 1
Location: Mizzou North		Start Date: 12/1/16
Surface Elevation:	Top of Casing Elevation:	Completion Date: 12/1/16
Drilling Contractor: Geodrill		Sample Method: Direct push
Drill Rig: Powerprobe 9500		
Water Encountered ? : NO		Total Boring Depth: 20
Initial Water Level:		Surface Casing Depth: -
Static Water Level:		Well Depth:
		Hole Diameter: 2 inch
		Inspector(s): DA
		Company: Schreiber, Yonley & Associates

Depth BGS (ft.)	Sample Interval	N	Rec. % RQD	PID Units	Description of Materials/Remarks	Moisture	Soil Class	Graphic Log	Well Diag.
1					1' Brown silty loam				
2			50	0.0	1' Gravel				
3	1								
4									
5					Gravel				
6	2		25	0.0					
7									
8									
9					Gravel				
10	3		25	0.0					
11									
12									
13					Gravel, moist				
14	4		25	0.0					
15									
16									
17					mottled brown, sandy silty clay				
18	5		50	0.0	w/ sand				
19					single colloidal at 19-20'				
20					PH06 19-20				

Notes:



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LOG OF TEST BORING

Client: University of Missouri	Project No: 162602.0219	Boring / Well No. <b>PH 07</b>
Project: Mizzou North UST In-Place Closure		Page No. 1 of 1
Location: Mizzou North		Start Date: 12/1/16
Surface Elevation:	Top of Casing Elevation:	Completion Date: 12/1/16
Drilling Contractor: Geodrill		Sample Method: Direct push
Drill Rig: Powerprobe 9500		
Water Encountered ? : NO	Total Boring Depth: <b>20'</b>	Hole Diameter: 2 inch
Initial Water Level:	Surface Casing Depth: -	Inspector(s): DA
Static Water Level:	Well Depth:	Company: Schreiber, Yonley & Associates

Depth BGS (ft.)	Sample Interval	N	Ree. % RQD	PID Units	Description of Materials/Remarks	Moisture	Soil Class	Graphic Log	Well Diag.
1					6" Brown silt/clay				
2	1		25	0.0	6" Gravel				
3									
4									
5					Gravel				
6	2		12.5	0.0					
7									
8									
9					Gravel				
10	3		12.5	0.0					
11									
12									
13					Gravel, moist				
14	4		25	0.0					
15									
16									
17					3" Gravel				
18	5		35	0.0					
19					Brown, grey mottled silt/clay w/ sand lenses				
20					Seep collected @ 19-20'				

Notes: PH 07 19-20



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LOG OF TEST BORING

Client: University of Missouri	Project No: 162602.0219	Boring / Well No. P108
Project: Mizzou North UST In-Place Closure	Page No. 1 of 1	
Location: Mizzou North	Start Date: 12/1/16	
Surface Elevation:	Top of Casing Elevation:	Completion Date: 12/1/16
Drilling Contractor: Geodrill	Sample Method: Direct push	
Drill Rig: Powerprobe 9500		
Water Encountered ? : NO	Total Boring Depth: 20'	Hole Diameter: 2 inch
Initial Water Level:	Surface Casing Depth: -	Inspector(s): DA
Static Water Level:	Well Depth:	Company: Schreiber, Yonley & Associates

Depth BGS (ft.)	Sample Interval	N	Rec. % RQD	PID Units	Description of Materials/Remarks	Moisture	Soil Class	Graphic Log	Well Diag.
1					1' Brown silty loam				
2			50	0.0	1' Gravel				
3	1								
4									
5									
6	2		25	0.0	Gravel				
7									
8									
9									
10	3		25	0.0	Gravel				
11									
12									
13									
14	4		25	0.0	Gravel, moist				
15									
16									
17	5		25	0.0	1/2" brown, grey mottled silty clay w/ sand				
18					slightly collapsed @ 18-19'				
19									
20					P108 18-19				

Notes:



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LOG OF TEST BORING

Client: University of Missouri	Project No: 162602.0219	Boring / Well No. PH09
Project: Mizzou North UST In-Place Closure		Page No. 1 of 1
Location: Mizzou North		Start Date: 12/1/16
Surface Elevation:	Top of Casing Elevation:	Completion Date: 12/1/16
Drilling Contractor: Geodrill		Sample Method: Direct push
Drill Rig: Powerprobe 9500		
Water Encountered ? : NO	Total Boring Depth: 8'	Hole Diameter: 2 inch
Initial Water Level:	Surface Casing Depth: -	Inspector(s): DA
Static Water Level:	Well Depth:	Company: Schreiber, Yonley & Associates

Depth BGS (ft.)	Sample Interval	N	Rec. % RQD	PID Units	Description of Materials/Remarks	Moisture	Soil Class	Graphic Log	Well Diag.
1					4" asphalt				
2	1		50	0.0	Gravel				
3									
4									
5					Greenish black silty clay				
6	2		50	0.1	Silty colloidal 4-5'				
7					PH09 4-5'				
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

Notes:

**APPENDIX J**  
**LABORATORY ANALYTICAL REPORTS**



14-Dec-2016

Doug Abeln  
Schreiber Yonley  
16252 Westwoods Business Park Drive  
Ellisville, MO 63021

Re: **MO UST Site**

Work Order: **1612251**

Dear Doug,

ALS Environmental received 9 samples on 03-Dec-2016 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 32.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

A handwritten signature in cursive script that reads "Alex Csaszar".

Electronically approved by: Alex Csaszar

Alex Csaszar  
Project Manager

Certificate No: MN 998501

### Report of Laboratory Analysis

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RIGHT SOLUTIONS RIGHT PARTNER

Client: Schreiber Yonley  
 Project: MO UST Site  
 Work Order: 1612251

**Work Order Sample Summary**

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
1612251-01	PH01 20-21	Soil		12/1/2016 08:45	12/3/2016 09:30	<input type="checkbox"/>
1612251-02	PH02 20-21	Soil		12/1/2016 09:20	12/3/2016 09:30	<input type="checkbox"/>
1612251-03	PH04 17-18	Soil		12/1/2016 10:35	12/3/2016 09:30	<input type="checkbox"/>
1612251-04	PH05 19-20	Soil		12/1/2016 10:55	12/3/2016 09:30	<input type="checkbox"/>
1612251-05	PH06 19-20	Soil		12/1/2016 11:30	12/3/2016 09:30	<input type="checkbox"/>
1612251-06	PH07 19-20	Soil		12/1/2016 12:10	12/3/2016 09:30	<input type="checkbox"/>
1612251-07	PH08 19-20	Soil		12/1/2016 13:20	12/3/2016 09:30	<input type="checkbox"/>
1612251-08	PH09 4-5	Soil		12/1/2016 13:40	12/3/2016 09:30	<input type="checkbox"/>
1612251-09	Trip Blank	Soil			12/3/2016 09:30	<input type="checkbox"/>



---

**Client:** Schreiber Yonley  
**Project:** MO UST Site  
**Work Order:** 1612251

---

**Case Narrative**

Samples for the above noted Work Order were received on 12/03/2016. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting. A copy of the laboratory's scope of accreditation is available upon request.

With the following exceptions, all sample analyses achieved analytical criteria.

Volatile Organics:

No other deviations or anomalies were noted.

Extractable Organics:

No other deviations or anomalies were noted.

Wet Chemistry:

No other deviations or anomalies were noted.

Client: Schreiber Yonley  
 Project: MO UST Site  
 WorkOrder: 1612251

**QUALIFIERS,  
 ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of I Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
% of sample	Percent of Sample
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: 14-Dec-16

Client: Schreiber Yonley  
 Project: MO UST Site  
 Sample ID: PH01 20-21  
 Collection Date: 12/1/2016 08:45 AM

Work Order: 1612251  
 Lab ID: 1612251-01  
 Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-MS</b>			<b>SW8270</b>		Prep: SW3546 / 12/7/16	Analyst: <b>RM</b>
DRO (C10-C21)	ND		5.8	mg/Kg-dry	1	12/12/2016 01:43 AM
Surr: 4-Terphenyl-d14	67.7		25-137	%REC	1	12/12/2016 01:43 AM
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>		Prep: SW3546 / 12/7/16	Analyst: <b>RS</b>
2-Chloronaphthalene	ND		7.8	µg/Kg-dry	1	12/8/2016 03:38 AM
2-Methylnaphthalene	ND		7.8	µg/Kg-dry	1	12/8/2016 03:38 AM
Acenaphthene	ND		7.8	µg/Kg-dry	1	12/8/2016 03:38 AM
Acenaphthylene	ND		7.8	µg/Kg-dry	1	12/8/2016 03:38 AM
Anthracene	ND		7.8	µg/Kg-dry	1	12/8/2016 03:38 AM
Benzo(a)anthracene	ND		7.8	µg/Kg-dry	1	12/8/2016 03:38 AM
Benzo(a)pyrene	ND		7.8	µg/Kg-dry	1	12/8/2016 03:38 AM
Benzo(b)fluoranthene	ND		7.8	µg/Kg-dry	1	12/8/2016 03:38 AM
Benzo(g,h,i)perylene	ND		7.8	µg/Kg-dry	1	12/8/2016 03:38 AM
Benzo(k)fluoranthene	ND		7.8	µg/Kg-dry	1	12/8/2016 03:38 AM
Chrysene	ND		7.8	µg/Kg-dry	1	12/8/2016 03:38 AM
Dibenzo(a,h)anthracene	ND		7.8	µg/Kg-dry	1	12/8/2016 03:38 AM
Fluoranthene	ND		7.8	µg/Kg-dry	1	12/8/2016 03:38 AM
Fluorene	ND		7.8	µg/Kg-dry	1	12/8/2016 03:38 AM
Indeno(1,2,3-cd)pyrene	ND		7.8	µg/Kg-dry	1	12/8/2016 03:38 AM
Naphthalene	ND		7.8	µg/Kg-dry	1	12/8/2016 03:38 AM
Phenanthrene	ND		7.8	µg/Kg-dry	1	12/8/2016 03:38 AM
Pyrene	ND		7.8	µg/Kg-dry	1	12/8/2016 03:38 AM
Surr: 2,4,6-Tribromophenol	75.3		34-140	%REC	1	12/8/2016 03:38 AM
Surr: 2-Fluorobiphenyl	87.1		12-100	%REC	1	12/8/2016 03:38 AM
Surr: 2-Fluorophenol	76.9		33-117	%REC	1	12/8/2016 03:38 AM
Surr: 4-Terphenyl-d14	94.2		25-137	%REC	1	12/8/2016 03:38 AM
Surr: Nitrobenzene-d5	68.3		37-107	%REC	1	12/8/2016 03:38 AM
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260B</b>		Prep: SW5035 / 12/6/16	Analyst: <b>LSY</b>
Benzene	ND		41	µg/Kg-dry	1	12/7/2016 02:46 AM
Ethylbenzene	ND		41	µg/Kg-dry	1	12/7/2016 02:46 AM
m,p-Xylene	ND		81	µg/Kg-dry	1	12/7/2016 02:46 AM
Methyl tert-butyl ether	ND		41	µg/Kg-dry	1	12/7/2016 02:46 AM
o-Xylene	ND		41	µg/Kg-dry	1	12/7/2016 02:46 AM
Toluene	ND		41	µg/Kg-dry	1	12/7/2016 02:46 AM
Xylenes, Total	ND		120	µg/Kg-dry	1	12/7/2016 02:46 AM
Surr: 1,2-Dichloroethane-d4	111		70-130	%REC	1	12/7/2016 02:46 AM
Surr: 4-Bromofluorobenzene	101		70-130	%REC	1	12/7/2016 02:46 AM
Surr: Dibromofluoromethane	99.0		70-130	%REC	1	12/7/2016 02:46 AM
Surr: Toluene-d8	99.5		70-130	%REC	1	12/7/2016 02:46 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group, USA**

Date: 14-Dec-16

Client: Schreiber Yonley  
Project: MO UST Site  
Sample ID: PH01 20-21  
Collection Date: 12/1/2016 08:45 AM

Work Order: 1612251  
Lab ID: 1612251-01  
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			SW3550C			Analyst: EDL
Moisture	15		0.050	% of sample	1	12/6/2016 05:39 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Schreiber Yonley  
 Project: MO UST Site  
 Sample ID: PH02 20-21  
 Collection Date: 12/1/2016 09:20 AM

Work Order: 1612251  
 Lab ID: 1612251-02  
 Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-MS</b>			<b>SW8270</b>		Prep: SW3546 / 12/7/16	Analyst: RM
DRO (C10-C21)	ND		6.5	mg/Kg-dry	1	12/12/2016 02:09 AM
Surr: 4-Terphenyl-d14	66.9		25-137	%REC	1	12/12/2016 02:09 AM
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>		Prep: SW3546 / 12/7/16	Analyst: RS
2-Chloronaphthalene	ND		8.7	µg/Kg-dry	1	12/8/2016 04:01 AM
2-Methylnaphthalene	ND		8.7	µg/Kg-dry	1	12/8/2016 04:01 AM
Acenaphthene	ND		8.7	µg/Kg-dry	1	12/8/2016 04:01 AM
Acenaphthylene	ND		8.7	µg/Kg-dry	1	12/8/2016 04:01 AM
Anthracene	ND		8.7	µg/Kg-dry	1	12/8/2016 04:01 AM
Benzo(a)anthracene	ND		8.7	µg/Kg-dry	1	12/8/2016 04:01 AM
Benzo(a)pyrene	ND		8.7	µg/Kg-dry	1	12/8/2016 04:01 AM
Benzo(b)fluoranthene	ND		8.7	µg/Kg-dry	1	12/8/2016 04:01 AM
Benzo(g,h,i)perylene	ND		8.7	µg/Kg-dry	1	12/8/2016 04:01 AM
Benzo(k)fluoranthene	ND		8.7	µg/Kg-dry	1	12/8/2016 04:01 AM
Chrysene	ND		8.7	µg/Kg-dry	1	12/8/2016 04:01 AM
Dibenzo(a,h)anthracene	ND		8.7	µg/Kg-dry	1	12/8/2016 04:01 AM
Fluoranthene	11		8.7	µg/Kg-dry	1	12/8/2016 04:01 AM
Fluorene	ND		8.7	µg/Kg-dry	1	12/8/2016 04:01 AM
Indeno(1,2,3-cd)pyrene	ND		8.7	µg/Kg-dry	1	12/8/2016 04:01 AM
Naphthalene	ND		8.7	µg/Kg-dry	1	12/8/2016 04:01 AM
Phenanthrene	ND		8.7	µg/Kg-dry	1	12/8/2016 04:01 AM
Pyrene	16		8.7	µg/Kg-dry	1	12/8/2016 04:01 AM
Surr: 2,4,6-Tribromophenol	72.9		34-140	%REC	1	12/8/2016 04:01 AM
Surr: 2-Fluorobiphenyl	83.5		12-100	%REC	1	12/8/2016 04:01 AM
Surr: 2-Fluorophenol	74.8		33-117	%REC	1	12/8/2016 04:01 AM
Surr: 4-Terphenyl-d14	93.2		25-137	%REC	1	12/8/2016 04:01 AM
Surr: Nitrobenzene-d5	67.4		37-107	%REC	1	12/8/2016 04:01 AM
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260B</b>		Prep: SW5035 / 12/6/16	Analyst: LSY
Benzene	ND		49	µg/Kg-dry	1	12/7/2016 03:11 AM
Ethylbenzene	ND		49	µg/Kg-dry	1	12/7/2016 03:11 AM
m,p-Xylene	ND		98	µg/Kg-dry	1	12/7/2016 03:11 AM
Methyl tert-butyl ether	ND		49	µg/Kg-dry	1	12/7/2016 03:11 AM
o-Xylene	ND		49	µg/Kg-dry	1	12/7/2016 03:11 AM
Toluene	ND		49	µg/Kg-dry	1	12/7/2016 03:11 AM
Xylenes, Total	ND		150	µg/Kg-dry	1	12/7/2016 03:11 AM
Surr: 1,2-Dichloroethane-d4	112		70-130	%REC	1	12/7/2016 03:11 AM
Surr: 4-Bromofluorobenzene	97.2		70-130	%REC	1	12/7/2016 03:11 AM
Surr: Dibromofluoromethane	96.6		70-130	%REC	1	12/7/2016 03:11 AM
Surr: Toluene-d8	97.2		70-130	%REC	1	12/7/2016 03:11 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group, USA**

Date: 14-Dec-16

Client: Schreiber Yonley  
Project: MO UST Site  
Sample ID: PH02 20-21  
Collection Date: 12/1/2016 09:20 AM

Work Order: 1612251  
Lab ID: 1612251-02  
Matrix: SOIL

---

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>MOISTURE</b>			<b>SW3550C</b>			Analyst: EDL
Moisture	24		0.050	% of sample	1	12/6/2016 05:39 PM

---

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Schreiber Yonley  
 Project: MO UST Site  
 Sample ID: PH04 17-18  
 Collection Date: 12/1/2016 10:35 AM

Work Order: 1612251  
 Lab ID: 1612251-03  
 Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-MS</b>			<b>SW8270</b>		Prep: SW3546 / 12/7/16	Analyst: RM
DRO (C10-C21)	ND		6.1	mg/Kg-dry	1	12/12/2016 02:35 AM
Surr: 4-Terphenyl-d14	62.7		25-137	%REC	1	12/12/2016 02:35 AM
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>		Prep: SW3546 / 12/7/16	Analyst: RS
2-Chloronaphthalene	ND		8.1	µg/Kg-dry	1	12/8/2016 04:24 AM
2-Methylnaphthalene	ND		8.1	µg/Kg-dry	1	12/8/2016 04:24 AM
Acenaphthene	ND		8.1	µg/Kg-dry	1	12/8/2016 04:24 AM
Acenaphthylene	ND		8.1	µg/Kg-dry	1	12/8/2016 04:24 AM
Anthracene	ND		8.1	µg/Kg-dry	1	12/8/2016 04:24 AM
Benzo(a)anthracene	45		8.1	µg/Kg-dry	1	12/8/2016 04:24 AM
Benzo(a)pyrene	44		8.1	µg/Kg-dry	1	12/8/2016 04:24 AM
Benzo(b)fluoranthene	68		8.1	µg/Kg-dry	1	12/8/2016 04:24 AM
Benzo(g,h,i)perylene	38		8.1	µg/Kg-dry	1	12/8/2016 04:24 AM
Benzo(k)fluoranthene	25		8.1	µg/Kg-dry	1	12/8/2016 04:24 AM
Chrysene	32		8.1	µg/Kg-dry	1	12/8/2016 04:24 AM
Dibenzo(a,h)anthracene	18		8.1	µg/Kg-dry	1	12/8/2016 04:24 AM
Fluoranthene	53		8.1	µg/Kg-dry	1	12/8/2016 04:24 AM
Fluorene	ND		8.1	µg/Kg-dry	1	12/8/2016 04:24 AM
Indeno(1,2,3-cd)pyrene	46		8.1	µg/Kg-dry	1	12/8/2016 04:24 AM
Naphthalene	ND		8.1	µg/Kg-dry	1	12/8/2016 04:24 AM
Phenanthrene	12		8.1	µg/Kg-dry	1	12/8/2016 04:24 AM
Pyrene	55		8.1	µg/Kg-dry	1	12/8/2016 04:24 AM
Surr: 2,4,6-Tribromophenol	73.0		34-140	%REC	1	12/8/2016 04:24 AM
Surr: 2-Fluorobiphenyl	89.8		12-100	%REC	1	12/8/2016 04:24 AM
Surr: 2-Fluorophenol	75.6		33-117	%REC	1	12/8/2016 04:24 AM
Surr: 4-Terphenyl-d14	95.6		25-137	%REC	1	12/8/2016 04:24 AM
Surr: Nitrobenzene-d5	68.1		37-107	%REC	1	12/8/2016 04:24 AM
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260B</b>		Prep: SW5035 / 12/6/16	Analyst: LSY
Benzene	ND		45	µg/Kg-dry	1	12/7/2016 03:35 AM
Ethylbenzene	ND		45	µg/Kg-dry	1	12/7/2016 03:35 AM
m,p-Xylene	ND		90	µg/Kg-dry	1	12/7/2016 03:35 AM
Methyl tert-butyl ether	ND		45	µg/Kg-dry	1	12/7/2016 03:35 AM
o-Xylene	ND		45	µg/Kg-dry	1	12/7/2016 03:35 AM
Toluene	ND		45	µg/Kg-dry	1	12/7/2016 03:35 AM
Xylenes, Total	ND		130	µg/Kg-dry	1	12/7/2016 03:35 AM
Surr: 1,2-Dichloroethane-d4	113		70-130	%REC	1	12/7/2016 03:35 AM
Surr: 4-Bromofluorobenzene	99.0		70-130	%REC	1	12/7/2016 03:35 AM
Surr: Dibromofluoromethane	99.4		70-130	%REC	1	12/7/2016 03:35 AM
Surr: Toluene-d8	99.5		70-130	%REC	1	12/7/2016 03:35 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group, USA**

Date: 14-Dec-16

Client: Schreiber Yonley  
Project: MO UST Site  
Sample ID: PH04 17-18  
Collection Date: 12/1/2016 10:35 AM

Work Order: 1612251  
Lab ID: 1612251-03  
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			SW3550C			Analyst: EDL
Moisture	19		0.050	% of sample	1	12/6/2016 05:39 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.



Client: Schreiber Yonley  
 Project: MO UST Site  
 Sample ID: PH05 19-20  
 Collection Date: 12/1/2016 10:55 AM

Work Order: 1612251  
 Lab ID: 1612251-04  
 Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-MS</b>			<b>SW8270</b>		Prep: SW3546 / 12/7/16	Analyst: RM
DRO (C10-C21)	ND		5.8	mg/Kg-dry	1	12/12/2016 03:01 AM
Surr: 4-Terphenyl-d14	61.1		25-137	%REC	1	12/12/2016 03:01 AM
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>		Prep: SW3546 / 12/7/16	Analyst: RS
2-Chloronaphthalene	ND		7.8	µg/Kg-dry	1	12/8/2016 04:47 AM
2-Methylnaphthalene	ND		7.8	µg/Kg-dry	1	12/8/2016 04:47 AM
Acenaphthene	ND		7.8	µg/Kg-dry	1	12/8/2016 04:47 AM
Acenaphthylene	ND		7.8	µg/Kg-dry	1	12/8/2016 04:47 AM
Anthracene	ND		7.8	µg/Kg-dry	1	12/8/2016 04:47 AM
Benzo(a)anthracene	ND		7.8	µg/Kg-dry	1	12/8/2016 04:47 AM
Benzo(a)pyrene	ND		7.8	µg/Kg-dry	1	12/8/2016 04:47 AM
Benzo(b)fluoranthene	ND		7.8	µg/Kg-dry	1	12/8/2016 04:47 AM
Benzo(g,h,i)perylene	ND		7.8	µg/Kg-dry	1	12/8/2016 04:47 AM
Benzo(k)fluoranthene	ND		7.8	µg/Kg-dry	1	12/8/2016 04:47 AM
Chrysene	ND		7.8	µg/Kg-dry	1	12/8/2016 04:47 AM
Dibenzo(a,h)anthracene	ND		7.8	µg/Kg-dry	1	12/8/2016 04:47 AM
Fluoranthene	ND		7.8	µg/Kg-dry	1	12/8/2016 04:47 AM
Fluorene	ND		7.8	µg/Kg-dry	1	12/8/2016 04:47 AM
Indeno(1,2,3-cd)pyrene	ND		7.8	µg/Kg-dry	1	12/8/2016 04:47 AM
Naphthalene	ND		7.8	µg/Kg-dry	1	12/8/2016 04:47 AM
Phenanthrene	ND		7.8	µg/Kg-dry	1	12/8/2016 04:47 AM
Pyrene	ND		7.8	µg/Kg-dry	1	12/8/2016 04:47 AM
Surr: 2,4,6-Tribromophenol	72.5		34-140	%REC	1	12/8/2016 04:47 AM
Surr: 2-Fluorobiphenyl	87.5		12-100	%REC	1	12/8/2016 04:47 AM
Surr: 2-Fluorophenol	77.8		33-117	%REC	1	12/8/2016 04:47 AM
Surr: 4-Terphenyl-d14	91.7		25-137	%REC	1	12/8/2016 04:47 AM
Surr: Nitrobenzene-d5	67.8		37-107	%REC	1	12/8/2016 04:47 AM
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260B</b>		Prep: SW5035 / 12/6/16	Analyst: LSY
Benzene	ND		44	µg/Kg-dry	1	12/7/2016 04:00 AM
Ethylbenzene	ND		44	µg/Kg-dry	1	12/7/2016 04:00 AM
m,p-Xylene	ND		88	µg/Kg-dry	1	12/7/2016 04:00 AM
Methyl tert-butyl ether	ND		44	µg/Kg-dry	1	12/7/2016 04:00 AM
o-Xylene	ND		44	µg/Kg-dry	1	12/7/2016 04:00 AM
Toluene	ND		44	µg/Kg-dry	1	12/7/2016 04:00 AM
Xylenes, Total	ND		130	µg/Kg-dry	1	12/7/2016 04:00 AM
Surr: 1,2-Dichloroethane-d4	110		70-130	%REC	1	12/7/2016 04:00 AM
Surr: 4-Bromofluorobenzene	97.4		70-130	%REC	1	12/7/2016 04:00 AM
Surr: Dibromofluoromethane	95.9		70-130	%REC	1	12/7/2016 04:00 AM
Surr: Toluene-d8	99.3		70-130	%REC	1	12/7/2016 04:00 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group, USA**

Date: 14-Dec-16

Client: Schreiber Yonley  
Project: MO UST Site  
Sample ID: PH05 19-20  
Collection Date: 12/1/2016 10:55 AM

Work Order: 1612251  
Lab ID: 1612251-04  
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			SW3550C			Analyst: EDL
Moisture	19		0.050	% of sample	1	12/6/2016 05:39 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group, USA**

Date: 14-Dec-16

**Client:** Schreiber Yonley  
**Project:** MO UST Site  
**Sample ID:** PH06 19-20  
**Collection Date:** 12/1/2016 11:30 AM

**Work Order:** 1612251  
**Lab ID:** 1612251-05  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-MS</b>			<b>SW8270</b>		Prep: SW3546 / 12/7/16	Analyst: <b>RM</b>
DRO (C10-C21)	28		6.1	mg/Kg-dry	1	12/12/2016 03:26 AM
Surr: 4-Terphenyl-d14	56.8		25-137	%REC	1	12/12/2016 03:26 AM
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>		Prep: SW3546 / 12/7/16	Analyst: <b>RS</b>
2-Chloronaphthalene	ND		8.1	µg/Kg-dry	1	12/8/2016 05:10 AM
2-Methylnaphthalene	ND		8.1	µg/Kg-dry	1	12/8/2016 05:10 AM
Acenaphthene	ND		8.1	µg/Kg-dry	1	12/8/2016 05:10 AM
Acenaphthylene	ND		8.1	µg/Kg-dry	1	12/8/2016 05:10 AM
Anthracene	ND		8.1	µg/Kg-dry	1	12/8/2016 05:10 AM
Benzo(a)anthracene	17		8.1	µg/Kg-dry	1	12/8/2016 05:10 AM
Benzo(a)pyrene	13		8.1	µg/Kg-dry	1	12/8/2016 05:10 AM
Benzo(b)fluoranthene	23		8.1	µg/Kg-dry	1	12/8/2016 05:10 AM
Benzo(g,h,i)perylene	11		8.1	µg/Kg-dry	1	12/8/2016 05:10 AM
Benzo(k)fluoranthene	11		8.1	µg/Kg-dry	1	12/8/2016 05:10 AM
Chrysene	ND		8.1	µg/Kg-dry	1	12/8/2016 05:10 AM
Dibenzo(a,h)anthracene	ND		8.1	µg/Kg-dry	1	12/8/2016 05:10 AM
Fluoranthene	19		8.1	µg/Kg-dry	1	12/8/2016 05:10 AM
Fluorene	ND		8.1	µg/Kg-dry	1	12/8/2016 05:10 AM
Indeno(1,2,3-cd)pyrene	9.7		8.1	µg/Kg-dry	1	12/8/2016 05:10 AM
Naphthalene	ND		8.1	µg/Kg-dry	1	12/8/2016 05:10 AM
Phenanthrene	ND		8.1	µg/Kg-dry	1	12/8/2016 05:10 AM
Pyrene	18		8.1	µg/Kg-dry	1	12/8/2016 05:10 AM
Surr: 2,4,6-Tribromophenol	76.6		34-140	%REC	1	12/8/2016 05:10 AM
Surr: 2-Fluorobiphenyl	84.9		12-100	%REC	1	12/8/2016 05:10 AM
Surr: 2-Fluorophenol	76.3		33-117	%REC	1	12/8/2016 05:10 AM
Surr: 4-Terphenyl-d14	97.5		25-137	%REC	1	12/8/2016 05:10 AM
Surr: Nitrobenzene-d5	63.8		37-107	%REC	1	12/8/2016 05:10 AM
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260B</b>		Prep: SW5035 / 12/6/16	Analyst: <b>LSY</b>
Benzene	ND		43	µg/Kg-dry	1	12/7/2016 04:25 AM
Ethylbenzene	ND		43	µg/Kg-dry	1	12/7/2016 04:25 AM
m,p-Xylene	ND		86	µg/Kg-dry	1	12/7/2016 04:25 AM
Methyl tert-butyl ether	ND		43	µg/Kg-dry	1	12/7/2016 04:25 AM
o-Xylene	ND		43	µg/Kg-dry	1	12/7/2016 04:25 AM
Toluene	ND		43	µg/Kg-dry	1	12/7/2016 04:25 AM
Xylenes, Total	ND		130	µg/Kg-dry	1	12/7/2016 04:25 AM
Surr: 1,2-Dichloroethane-d4	111		70-130	%REC	1	12/7/2016 04:25 AM
Surr: 4-Bromofluorobenzene	97.2		70-130	%REC	1	12/7/2016 04:25 AM
Surr: Dibromofluoromethane	96.3		70-130	%REC	1	12/7/2016 04:25 AM
Surr: Toluene-d8	97.8		70-130	%REC	1	12/7/2016 04:25 AM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group, USA**

Date: 14-Dec-16

Client: Schreiber Yonley  
Project: MO UST Site  
Sample ID: PH06 19-20  
Collection Date: 12/1/2016 11:30 AM

Work Order: 1612251  
Lab ID: 1612251-05  
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE Moisture	18		SW3550C 0.050	% of sample	1	Analyst: EDL 12/7/2016 06:47 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Schreiber Yonley  
 Project: MO UST Site  
 Sample ID: PH07 19-20  
 Collection Date: 12/1/2016 12:10 PM

Work Order: 1612251  
 Lab ID: 1612251-06  
 Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-MS</b>			<b>SW8270</b>		Prep: SW3546 / 12/7/16	Analyst: RM
DRO (C10-C21)	ND		5.9	mg/Kg-dry	1	12/12/2016 03:52 AM
Surr: 4-Terphenyl-d14	69.8		25-137	%REC	1	12/12/2016 03:52 AM
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>		Prep: SW3546 / 12/7/16	Analyst: RS
2-Chloronaphthalene	ND		7.8	µg/Kg-dry	1	12/7/2016 11:27 PM
2-Methylnaphthalene	ND		7.8	µg/Kg-dry	1	12/7/2016 11:27 PM
Acenaphthene	ND		7.8	µg/Kg-dry	1	12/7/2016 11:27 PM
Acenaphthylene	ND		7.8	µg/Kg-dry	1	12/7/2016 11:27 PM
Anthracene	ND		7.8	µg/Kg-dry	1	12/7/2016 11:27 PM
Benzo(a)anthracene	ND		7.8	µg/Kg-dry	1	12/7/2016 11:27 PM
Benzo(a)pyrene	ND		7.8	µg/Kg-dry	1	12/7/2016 11:27 PM
Benzo(b)fluoranthene	ND		7.8	µg/Kg-dry	1	12/7/2016 11:27 PM
Benzo(g,h,i)perylene	ND		7.8	µg/Kg-dry	1	12/7/2016 11:27 PM
Benzo(k)fluoranthene	ND		7.8	µg/Kg-dry	1	12/7/2016 11:27 PM
Chrysene	ND		7.8	µg/Kg-dry	1	12/7/2016 11:27 PM
Dibenzo(a,h)anthracene	ND		7.8	µg/Kg-dry	1	12/7/2016 11:27 PM
Fluoranthene	13		7.8	µg/Kg-dry	1	12/7/2016 11:27 PM
Fluorene	ND		7.8	µg/Kg-dry	1	12/7/2016 11:27 PM
Indeno(1,2,3-cd)pyrene	ND		7.8	µg/Kg-dry	1	12/7/2016 11:27 PM
Naphthalene	ND		7.8	µg/Kg-dry	1	12/7/2016 11:27 PM
Phenanthrene	ND		7.8	µg/Kg-dry	1	12/7/2016 11:27 PM
Pyrene	15		7.8	µg/Kg-dry	1	12/7/2016 11:27 PM
Surr: 2,4,6-Tribromophenol	62.3		34-140	%REC	1	12/7/2016 11:27 PM
Surr: 2-Fluorobiphenyl	85.6		12-100	%REC	1	12/7/2016 11:27 PM
Surr: 2-Fluorophenol	70.1		33-117	%REC	1	12/7/2016 11:27 PM
Surr: 4-Terphenyl-d14	94.3		25-137	%REC	1	12/7/2016 11:27 PM
Surr: Nitrobenzene-d5	61.5		37-107	%REC	1	12/7/2016 11:27 PM
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260B</b>		Prep: SW5035 / 12/6/16	Analyst: LSY
Benzene	ND		42	µg/Kg-dry	1	12/6/2016 08:38 PM
Ethylbenzene	ND		42	µg/Kg-dry	1	12/6/2016 08:38 PM
m,p-Xylene	ND		85	µg/Kg-dry	1	12/6/2016 08:38 PM
Methyl tert-butyl ether	ND		42	µg/Kg-dry	1	12/6/2016 08:38 PM
o-Xylene	ND		42	µg/Kg-dry	1	12/6/2016 08:38 PM
Toluene	ND		42	µg/Kg-dry	1	12/6/2016 08:38 PM
Xylenes, Total	ND		130	µg/Kg-dry	1	12/6/2016 08:38 PM
Surr: 1,2-Dichloroethane-d4	113		70-130	%REC	1	12/6/2016 08:38 PM
Surr: 4-Bromofluorobenzene	98.5		70-130	%REC	1	12/6/2016 08:38 PM
Surr: Dibromofluoromethane	93.8		70-130	%REC	1	12/6/2016 08:38 PM
Surr: Toluene-d8	98.2		70-130	%REC	1	12/6/2016 08:38 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group, USA**

Date: 14-Dec-16

Client: Schreiber Yonley  
Project: MO UST Site  
Sample ID: PH07 19-20  
Collection Date: 12/1/2016 12:10 PM

Work Order: 1612251  
Lab ID: 1612251-06  
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			SW3550C			Analyst: EDL
Moisture	17		0.050	% of sample	1	12/7/2016 06:47 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Schreiber Yonley  
 Project: MO UST Site  
 Sample ID: PH08 19-20  
 Collection Date: 12/1/2016 01:20 PM

Work Order: 1612251  
 Lab ID: 1612251-07  
 Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-MS</b>			<b>SW8270</b>		Prep: SW3546 / 12/7/16	Analyst: RM
DRO (C10-C21)	ND		5.5	mg/Kg-dry	1	12/12/2016 04:18 AM
Surr: 4-Terphenyl-d14	59.6		25-137	%REC	1	12/12/2016 04:18 AM
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>		Prep: SW3546 / 12/7/16	Analyst: RS
2-Chloronaphthalene	ND		7.4	µg/Kg-dry	1	12/8/2016 05:32 AM
2-Methylnaphthalene	ND		7.4	µg/Kg-dry	1	12/8/2016 05:32 AM
Acenaphthene	ND		7.4	µg/Kg-dry	1	12/8/2016 05:32 AM
Acenaphthylene	ND		7.4	µg/Kg-dry	1	12/8/2016 05:32 AM
Anthracene	ND		7.4	µg/Kg-dry	1	12/8/2016 05:32 AM
Benzo(a)anthracene	56		7.4	µg/Kg-dry	1	12/8/2016 05:32 AM
Benzo(a)pyrene	56		7.4	µg/Kg-dry	1	12/8/2016 05:32 AM
Benzo(b)fluoranthene	76		7.4	µg/Kg-dry	1	12/8/2016 05:32 AM
Benzo(g,h,i)perylene	43		7.4	µg/Kg-dry	1	12/8/2016 05:32 AM
Benzo(k)fluoranthene	36		7.4	µg/Kg-dry	1	12/8/2016 05:32 AM
Chrysene	50		7.4	µg/Kg-dry	1	12/8/2016 05:32 AM
Dibenzo(a,h)anthracene	21		7.4	µg/Kg-dry	1	12/8/2016 05:32 AM
Fluoranthene	110		7.4	µg/Kg-dry	1	12/8/2016 05:32 AM
Fluorene	ND		7.4	µg/Kg-dry	1	12/8/2016 05:32 AM
Indeno(1,2,3-cd)pyrene	55		7.4	µg/Kg-dry	1	12/8/2016 05:32 AM
Naphthalene	ND		7.4	µg/Kg-dry	1	12/8/2016 05:32 AM
Phenanthrene	11		7.4	µg/Kg-dry	1	12/8/2016 05:32 AM
Pyrene	92		7.4	µg/Kg-dry	1	12/8/2016 05:32 AM
Surr: 2,4,6-Tribromophenol	76.9		34-140	%REC	1	12/8/2016 05:32 AM
Surr: 2-Fluorobiphenyl	89.8		12-100	%REC	1	12/8/2016 05:32 AM
Surr: 2-Fluorophenol	80.4		33-117	%REC	1	12/8/2016 05:32 AM
Surr: 4-Terphenyl-d14	97.2		25-137	%REC	1	12/8/2016 05:32 AM
Surr: Nitrobenzene-d5	66.4		37-107	%REC	1	12/8/2016 05:32 AM
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260B</b>		Prep: SW5035 / 12/6/16	Analyst: LSY
Benzene	ND		39	µg/Kg-dry	1	12/7/2016 04:49 AM
Ethylbenzene	ND		39	µg/Kg-dry	1	12/7/2016 04:49 AM
m,p-Xylene	ND		78	µg/Kg-dry	1	12/7/2016 04:49 AM
Methyl tert-butyl ether	ND		39	µg/Kg-dry	1	12/7/2016 04:49 AM
o-Xylene	ND		39	µg/Kg-dry	1	12/7/2016 04:49 AM
Toluene	ND		39	µg/Kg-dry	1	12/7/2016 04:49 AM
Xylenes, Total	ND		120	µg/Kg-dry	1	12/7/2016 04:49 AM
Surr: 1,2-Dichloroethane-d4	110		70-130	%REC	1	12/7/2016 04:49 AM
Surr: 4-Bromofluorobenzene	99.6		70-130	%REC	1	12/7/2016 04:49 AM
Surr: Dibromofluoromethane	99.0		70-130	%REC	1	12/7/2016 04:49 AM
Surr: Toluene-d8	97.0		70-130	%REC	1	12/7/2016 04:49 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group, USA**

Date: 14-Dec-16

Client: Schreiber Yonley  
Project: MO UST Site  
Sample ID: PH08 19-20  
Collection Date: 12/1/2016 01:20 PM

Work Order: 1612251  
Lab ID: 1612251-07  
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			SW3550C			Analyst: EDL
Moisture	13		0.050	% of sample	1	12/7/2016 06:47 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.



ALS Group, USA

Date: 14-Dec-16

Client: Schreiber Yonley  
 Project: MO UST Site  
 Sample ID: PH09 4-5  
 Collection Date: 12/1/2016 01:40 PM

Work Order: 1612251  
 Lab ID: 1612251-08  
 Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilntion Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-MS</b>			<b>SW8270</b>		Prep: SW3546 / 12/7/16	Analyst: <b>RM</b>
DRO (C10-C21)	110		61	mg/Kg-dry	10	12/12/2016 04:44 AM
Surr: 4-Terphenyl-d14	59.4		25-137	%REC	10	12/12/2016 04:44 AM
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>			<b>SW846 8270D</b>		Prep: SW3546 / 12/7/16	Analyst: <b>RS</b>
2-Chloronaphthalene	ND		8.1	µg/Kg-dry	1	12/8/2016 05:55 AM
2-Methylnaphthalene	33		8.1	µg/Kg-dry	1	12/8/2016 05:55 AM
Acenaphthene	33		8.1	µg/Kg-dry	1	12/8/2016 05:55 AM
Acenaphthylene	ND		8.1	µg/Kg-dry	1	12/8/2016 05:55 AM
Anthracene	49		8.1	µg/Kg-dry	1	12/8/2016 05:55 AM
Benzo(a)anthracene	96		8.1	µg/Kg-dry	1	12/8/2016 05:55 AM
Benzo(a)pyrene	79		8.1	µg/Kg-dry	1	12/8/2016 05:55 AM
Benzo(b)fluoranthene	110		8.1	µg/Kg-dry	1	12/8/2016 05:55 AM
Benzo(g,h,i)perylene	49		8.1	µg/Kg-dry	1	12/8/2016 05:55 AM
Benzo(k)fluoranthene	36		8.1	µg/Kg-dry	1	12/8/2016 05:55 AM
Chrysene	110		8.1	µg/Kg-dry	1	12/8/2016 05:55 AM
Dibenzo(a,h)anthracene	16		8.1	µg/Kg-dry	1	12/8/2016 05:55 AM
Fluoranthene	170		8.1	µg/Kg-dry	1	12/8/2016 05:55 AM
Fluorene	65		8.1	µg/Kg-dry	1	12/8/2016 05:55 AM
Indeno(1,2,3-cd)pyrene	47		8.1	µg/Kg-dry	1	12/8/2016 05:55 AM
Naphthalene	ND		8.1	µg/Kg-dry	1	12/8/2016 05:55 AM
Phenanthrene	310		8.1	µg/Kg-dry	1	12/8/2016 05:55 AM
Pyrene	170		8.1	µg/Kg-dry	1	12/8/2016 05:55 AM
Surr: 2,4,6-Tribromophenol	76.8		34-140	%REC	1	12/8/2016 05:55 AM
Surr: 2-Fluorobiphenyl	79.0		12-100	%REC	1	12/8/2016 05:55 AM
Surr: 2-Fluorophenol	65.2		33-117	%REC	1	12/8/2016 05:55 AM
Surr: 4-Terphenyl-d14	92.3		25-137	%REC	1	12/8/2016 05:55 AM
Surr: Nitrobenzene-d5	46.6		37-107	%REC	1	12/8/2016 05:55 AM
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260B</b>		Prep: SW5035 / 12/6/16	Analyst: <b>LSY</b>
Benzene	ND		48	µg/Kg-dry	1	12/7/2016 05:14 AM
Ethylbenzene	ND		48	µg/Kg-dry	1	12/7/2016 05:14 AM
m,p-Xylene	ND		96	µg/Kg-dry	1	12/7/2016 05:14 AM
Methyl tert-butyl ether	ND		48	µg/Kg-dry	1	12/7/2016 05:14 AM
o-Xylene	ND		48	µg/Kg-dry	1	12/7/2016 05:14 AM
Toluene	ND		48	µg/Kg-dry	1	12/7/2016 05:14 AM
Xylenes, Total	ND		140	µg/Kg-dry	1	12/7/2016 05:14 AM
Surr: 1,2-Dichloroethane-d4	111		70-130	%REC	1	12/7/2016 05:14 AM
Surr: 4-Bromofluorobenzene	101		70-130	%REC	1	12/7/2016 05:14 AM
Surr: Dibromofluoromethane	92.0		70-130	%REC	1	12/7/2016 05:14 AM
Surr: Toluene-d8	97.8		70-130	%REC	1	12/7/2016 05:14 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group, USA**

Date: 14-Dec-16

Client: Schreiber Yonley  
Project: MO UST Site  
Sample ID: PH09 4-5  
Collection Date: 12/1/2016 01:40 PM

Work Order: 1612251  
Lab ID: 1612251-08  
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			SW3550C			Analyst: EDL
Moisture	23		0.050	% of sample	1	12/7/2016 06:47 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Schreiber Yonley  
 Project: MO UST Site  
 Sample ID: Trip Blank  
 Collection Date:

Work Order: 1612251  
 Lab ID: 1612251-09  
 Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260B</b>		Prep: SW5035 / 12/6/16	Analyst: LSY
Benzene	ND		30	µg/Kg-dry	1	12/7/2016 05:38 AM
Ethylbenzene	ND		30	µg/Kg-dry	1	12/7/2016 05:38 AM
m,p-Xylene	ND		60	µg/Kg-dry	1	12/7/2016 05:38 AM
Methyl tert-butyl ether	ND		30	µg/Kg-dry	1	12/7/2016 05:38 AM
o-Xylene	ND		30	µg/Kg-dry	1	12/7/2016 05:38 AM
Toluene	ND		30	µg/Kg-dry	1	12/7/2016 05:38 AM
Xylenes, Total	ND		90	µg/Kg-dry	1	12/7/2016 05:38 AM
Surr: 1,2-Dichloroethane-d4	112		70-130	%REC	1	12/7/2016 05:38 AM
Surr: 4-Bromofluorobenzene	99.4		70-130	%REC	1	12/7/2016 05:38 AM
Surr: Dibromofluoromethane	93.0		70-130	%REC	1	12/7/2016 05:38 AM
Surr: Toluene-d8	100		70-130	%REC	1	12/7/2016 05:38 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Schreiber Yonley  
 Work Order: 1612251  
 Project: MO UST Site

**QC BATCH REPORT**

Batch ID: 95514 Instrument ID SVMS5 Method: SW846 8270D

MBLK		Sample ID: SBLKS1-95514-95514			Units: µg/Kg		Analysis Date: 12/7/2016 09:21 PM			
Client ID:		Run ID: SVMS5_161207A			SeqNo: 4192522		Prep Date: 12/7/2016		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Chloronaphthalene	ND	6.7								
2-Methylnaphthalene	ND	6.7								
Acenaphlhene	ND	6.7								
Acenaphlhylene	ND	6.7								
Anthracene	ND	6.7								
Benzo(a)anthracene	ND	6.7								
Benzo(a)pyrene	ND	6.7								
Benzo(b)fluoranthene	ND	6.7								
Benzo(g,h,i)perylene	ND	6.7								
Benzo(k)fluoranthene	ND	6.7								
Chrysene	ND	6.7								
Dibenzo(a,h)anthracene	ND	6.7								
Fluoranthene	ND	6.7								
Fluorene	ND	6.7								
Indeno(1,2,3-cd)pyrene	ND	6.7								
Naphthalene	ND	6.7								
Phenanthrene	ND	6.7								
Pyrene	ND	6.7								
Surr: 2,4,6-Tribromophenol	2045	0	3333	0	61.4	34-140		0		
Surr: 2-Fluorobiphenyl	2907	0	3333	0	87.2	12-100		0		
Surr: 2-Fluorophenol	2275	0	3333	0	68.2	33-117		0		
Surr: 4-Terphenyl-d14	3200	0	3333	0	96	25-137		0		
Surr: Nitrobenzene-d5	2081	0	3333	0	62.4	37-107		0		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Schreiber Yonlcy  
 Work Order: 1612251  
 Project: MO UST Site

## QC BATCH REPORT

Batch ID: 95514 Instrument ID SVMS5 Method: SW846 8270D

LCS		Sample ID: SLCSS1-95514-95514				Units: µg/Kg		Analysis Date: 12/7/2016 09:44 PM		
Client ID:		Run ID: SVMS5_161207A			SeqNo: 4192523		Prep Date: 12/7/2016		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Chloronaphthalene	1240	6.7	1333	0	93	45-105	0			
2-Methylnaphthalene	1051	6.7	1333	0	78.8	45-105	0			
Acenaphthene	1143	6.7	1333	0	85.8	45-110	0			
Acenaphthylene	1216	6.7	1333	0	91.2	45-105	0			
Anthracene	1065	6.7	1333	0	79.9	55-105	0			
Benzo(a)anthracene	1149	6.7	1333	0	86.2	50-110	0			
Benzo(a)pyrene	1123	6.7	1333	0	84.2	50-110	0			
Benzo(b)fluoranthene	1113	6.7	1333	0	83.5	45-115	0			
Benzo(g,h,i)perylene	1112	6.7	1333	0	83.4	40-125	0			
Benzo(k)fluoranthene	1134	6.7	1333	0	85.1	45-115	0			
Chrysene	1161	6.7	1333	0	87.1	55-110	0			
Dibenzo(a,h)anthracene	1097	6.7	1333	0	82.3	40-125	0			
Fluoranthene	1205	6.7	1333	0	90.4	55-115	0			
Fluorene	1261	6.7	1333	0	94.6	50-110	0			
Indeno(1,2,3-cd)pyrene	1081	6.7	1333	0	81.1	40-120	0			
Naphthalene	958.7	6.7	1333	0	71.9	40-105	0			
Phenanthrene	1161	6.7	1333	0	87.1	50-110	0			
Pyrene	1249	6.7	1333	0	93.7	45-125	0			
Surr: 2,4,6-Tribromophenol	2550	0	3333	0	76.5	34-140	0			
Surr: 2-Fluorobiphenyl	3005	0	3333	0	90.1	12-100	0			
Surr: 2-Fluorophenol	2318	0	3333	0	69.5	33-117	0			
Surr: 4-Terphenyl-d14	3075	0	3333	0	92.2	25-137	0			
Surr: Nitrobenzene-d5	2169	0	3333	0	65.1	37-107	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Schreiber Yonley  
 Work Order: 1612251  
 Project: MO UST Site

## QC BATCH REPORT

Batch ID: 95514 Instrument ID SVMS5 Method: SW846 8270D

MS Sample ID: 1612251-06B MS Units: µg/Kg Analysis Date: 12/7/2016 10:41 PM  
 Client ID: PH07 19-20 Run ID: SVMS5\_161207A SeqNo: 4192524 Prep Date: 12/7/2016 DF: 1

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Chloronaphthalene	1148	6.3	1266	0	90.7	45-105	0			
2-Methylnaphthalene	985.1	6.3	1266	0	77.8	45-105	0			
Acenaphthene	1035	6.3	1266	0	81.8	45-110	0			
Acenaphthylene	1112	6.3	1266	0	87.9	45-105	0			
Anthracene	974.9	6.3	1266	0	77	55-105	0			
Benzo(a)anthracene	1069	6.3	1266	0	84.4	50-110	0			
Benzo(a)pyrene	1039	6.3	1266	0	82.1	50-110	0			
Benzo(b)fluoranthene	1053	6.3	1266	0	83.2	45-115	0			
Benzo(g,h,i)perylene	1036	6.3	1266	0	81.8	40-125	0			
Benzo(k)fluoranthene	992.7	6.3	1266	0	78.4	45-115	0			
Chrysene	1085	6.3	1266	0	85.7	55-110	0			
Dibenzo(a,h)anthracene	1018	6.3	1266	0	80.4	40-125	0			
Fluoranthene	1124	6.3	1266	11	87.9	55-115	0			
Fluorene	1167	6.3	1266	0	92.2	50-110	0			
Indeno(1,2,3-cd)pyrene	976.2	6.3	1266	0	77.1	40-120	0			
Naphthalene	875.5	6.3	1266	0	69.2	40-105	0			
Phenanthrene	1055	6.3	1266	0	83.4	50-110	0			
Pyrene	1146	6.3	1266	12.29	89.6	45-125	0			
Surr: 2,4,6-Tribromophenol	2338	0	3165	0	73.9	34-140	0			
Surr: 2-Fluorobiphenyl	2792	0	3165	0	88.2	12-100	0			
Surr: 2-Fluorophenol	2129	0	3165	0	67.3	33-117	0			
Surr: 4-Terphenyl-d14	2819	0	3165	0	89.1	25-137	0			
Surr: Nitrobenzene-d5	1983	0	3165	0	62.6	37-107	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Schreiber Yonley  
 Work Order: 1612251  
 Project: MO UST Site

## QC BATCH REPORT

Batch ID: 95514 Instrument ID SVMS5 Method: SW846 8270D

MSD		Sample ID: 1612251-06B MSD			Units: µg/Kg		Analysis Date: 12/7/2016 11:04 PM			
Client ID: PH07 19-20		Run ID: SVMS5_161207A			SeqNo: 4192525		Prep Date: 12/7/2016		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Chloronaphthalene	1128	6.4	1287	0	87.7	45-105	1148	1.74	30	
2-Methylnaphthalene	977.4	6.4	1287	0	76	45-105	985.1	0.779	30	
Acenaphthene	1037	6.4	1287	0	80.6	45-110	1035	0.211	30	
Acenaphthylene	1083	6.4	1287	0	84.2	45-105	1112	2.68	30	
Anthracene	1036	6.4	1287	0	80.5	55-105	974.9	6.07	30	
Benzo(a)anthracene	1116	6.4	1287	0	86.8	50-110	1069	4.37	30	
Benzo(a)pyrene	1080	6.4	1287	0	84	50-110	1039	3.92	30	
Benzo(b)fluoranthene	1073	6.4	1287	0	83.4	45-115	1053	1.93	30	
Benzo(g,h,i)perylene	1098	6.4	1287	0	85.3	40-125	1036	5.82	30	
Benzo(k)fluoranthene	1076	6.4	1287	0	83.6	45-115	992.7	8.05	30	
Chrysene	1156	6.4	1287	0	89.8	55-110	1085	6.3	30	
Dibenzo(a,h)anthracene	1075	6.4	1287	0	83.6	40-125	1018	5.47	30	
Fluoranthene	1190	6.4	1287	11	91.7	55-115	1124	5.76	30	
Fluorene	1191	6.4	1287	0	92.6	50-110	1167	2.06	30	
Indeno(1,2,3-cd)pyrene	1030	6.4	1287	0	80	40-120	976.2	5.32	30	
Naphthalene	880.9	6.4	1287	0	68.5	40-105	875.5	0.61	30	
Phenanthrene	1125	6.4	1287	0	87.5	50-110	1055	6.43	30	
Pyrene	1262	6.4	1287	12.29	97.2	45-125	1146	9.63	30	
Surr: 2,4,6-Tribromophenol	2479	0	3217	0	77	34-140	2338	5.84	40	
Surr: 2-Fluorobiphenyl	2733	0	3217	0	84.9	12-100	2792	2.16	40	
Surr: 2-Fluorophenol	2111	0	3217	0	65.6	33-117	2129	0.871	40	
Surr: 4-Terphenyl-d14	3138	0	3217	0	97.5	25-137	2819	10.7	40	
Surr: Nitrobenzene-d5	2022	0	3217	0	62.9	37-107	1983	1.98	40	

The following samples were analyzed in this batch:

1612251-01B	1612251-02B	1612251-03B
1612251-04B	1612251-05B	1612251-06B
1612251-07B	1612251-08B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Schreiber Yonley  
 Work Order: 1612251  
 Project: MO UST Site

## QC BATCH REPORT

Batch ID: 95515      Instrument ID SVMS8      Method: SW8270

MBLK		Sample ID: DBLKS1-95515-95515				Units: mg/Kg		Analysis Date: 12/11/2016 11:33 PM			
Client ID:		Run ID: SVMS8_161211A				SeqNo: 4200055		Prep Date: 12/7/2016		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
DRO (C10-C21)	ND	5.0									
<i>Surr: 4-Terphenyl-d14</i>	2.411	0	3.333	0	72.3	25-137	0				

LCS		Sample ID: DLCSS1-95515-95515				Units: mg/Kg		Analysis Date: 12/11/2016 11:59 PM			
Client ID:		Run ID: SVMS8_161211A				SeqNo: 4200056		Prep Date: 12/7/2016		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
DRO (C10-C21)	276.8	5.0	333.3	0	83	31-135	0				
<i>Surr: 4-Terphenyl-d14</i>	2.513	0	3.333	0	75.4	25-137	0				

MS		Sample ID: 1612170-01A MS				Units: mg/Kg		Analysis Date: 12/12/2016 12:25 A			
Client ID:		Run ID: SVMS8_161211A				SeqNo: 4200057		Prep Date: 12/7/2016		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
DRO (C10-C21)	1161	4.9	323.8	727.4	134	31-135	0				
<i>Surr: 4-Terphenyl-d14</i>	1.929	0	3.238	0	59.6	25-137	0				

MSD		Sample ID: 1612170-01A MSD				Units: mg/Kg		Analysis Date: 12/12/2016 12:51 A			
Client ID:		Run ID: SVMS8_161211A				SeqNo: 4200058		Prep Date: 12/7/2016		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
DRO (C10-C21)	1337	4.8	317.6	727.4	192	31-135	1161	14	30	S	
<i>Surr: 4-Terphenyl-d14</i>	2.701	0	3.175	0	85	25-137	1.929	33.3	30	R	

The following samples were analyzed in this batch:

1612251-01B	1612251-02B	1612251-03B
1612251-04B	1612251-05B	1612251-06B
1612251-07B	1612251-08B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.



Client: Schreiber Yonley  
 Work Order: 1612251  
 Project: MO UST Site

## QC BATCH REPORT

Batch ID: 95461 Instrument ID VMS9 Method: SW8260B

MBLK		Sample ID: MBLK-95461-95461				Units: µg/Kg-dry		Analysis Date: 12/6/2016 02:06 PM			
Client ID:		Run ID: VMS9_161206A		SeqNo: 4189065		Prep Date: 12/6/2016		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	ND	30	0	0	0	0-0	0				
Ethylbenzene	ND	30	0	0	0	0-0	0				
m,p-Xylene	ND	60	0	0	0	0-0	0				
Methyl tert-butyl ether	ND	30	0	0	0	0-0	0				
o-Xylene	ND	30	0	0	0	0-0	0				
Toluene	ND	30	0	0	0	0-0	0				
Xylenes, Total	ND	90	0	0	0	0-0	0				
Surr: 1,2-Dichloroethane-d4	1130	0	1000	0	113	70-130	0				
Surr: 4-Bromofluorobenzene	984	0	1000	0	98.4	70-130	0				
Surr: Dibromofluoromethane	929	0	1000	0	92.9	70-130	0				
Surr: Toluene-d8	991.5	0	1000	0	99.2	70-130	0				

LCS		Sample ID: LCS-95461-95461				Units: µg/Kg-dry		Analysis Date: 12/6/2016 12:52 PM			
Client ID:		Run ID: VMS9_161206A		SeqNo: 4189063		Prep Date: 12/6/2016		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	1062	30	1000	0	106	75-125	0				
Ethylbenzene	1120	30	1000	0	112	75-125	0				
m,p-Xylene	2238	60	2000	0	112	80-125	0				
Methyl tert-butyl ether	1011	30	1000	0	101	75-125	0				
o-Xylene	1114	30	1000	0	111	75-125	0				
Toluene	1022	30	1000	0	102	70-125	0				
Xylenes, Total	3352	90	3000	0	112	75-125	0				
Surr: 1,2-Dichloroethane-d4	1010	0	1000	0	101	70-130	0				
Surr: 4-Bromofluorobenzene	1006	0	1000	0	101	70-130	0				
Surr: Dibromofluoromethane	1024	0	1000	0	102	70-130	0				
Surr: Toluene-d8	996.5	0	1000	0	99.6	70-130	0				

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Schreiber Yonley  
 Work Order: 1612251  
 Project: MO UST Site

## QC BATCH REPORT

Batch ID: 95461 Instrument ID VMS9 Method: SW8260B

MS		Sample ID: 1612251-06A MS				Units: µg/Kg-dry		Analysis Date: 12/6/2016 09:52 PM			
Client ID: PH07 19-20		Run ID: VMS9_161206A				SeqNo: 4189074		Prep Date: 12/6/2016		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	1552	42	1410	0	110	75-125	0				
Ethylbenzene	1472	42	1410	0	104	75-125	0				
m,p-Xylene	2915	85	2819	0	103	80-125	0				
Methyl tert-butyl ether	1193	42	1410	0	84.6	75-125	0				
o-Xylene	1486	42	1410	0	105	75-125	0				
Toluene	1355	42	1410	0	96.2	70-125	0				
Xylenes, Total	4402	130	4229	0	104	75-125	0				
Surr: 1,2-Dichloroethane-d4	1591	0	1410	0	113	70-130	0				
Surr: 4-Bromofluorobenzene	1505	0	1410	0	107	70-130	0				
Surr: Dibromofluoromethane	1508	0	1410	0	107	70-130	0				
Surr: Toluene-d8	1410	0	1410	0	100	70-130	0				

MSD		Sample ID: 1612251-06A MSD				Units: µg/Kg-dry		Analysis Date: 12/6/2016 10:16 PM			
Client ID: PH07 19-20		Run ID: VMS9_161206A				SeqNo: 4189076		Prep Date: 12/6/2016		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	1525	42	1410	0	108	75-125	1552	1.74	30		
Ethylbenzene	1447	42	1410	0	103	75-125	1472	1.69	30		
m,p-Xylene	2893	85	2819	0	103	80-125	2915	0.777	30		
Methyl tert-butyl ether	1219	42	1410	0	86.4	75-125	1193	2.16	30		
o-Xylene	1456	42	1410	0	103	75-125	1486	2.06	30		
Toluene	1317	42	1410	0	93.4	70-125	1355	2.9	30		
Xylenes, Total	4349	130	4229	0	103	75-125	4402	1.21	30		
Surr: 1,2-Dichloroethane-d4	1561	0	1410	0	111	70-130	1591	1.88	30		
Surr: 4-Bromofluorobenzene	1471	0	1410	0	104	70-130	1505	2.27	30		
Surr: Dibromofluoromethane	1376	0	1410	0	97.6	70-130	1508	9.19	30		
Surr: Toluene-d8	1395	0	1410	0	99	70-130	1410	1.11	30		

The following samples were analyzed in this batch:

1612251-01A	1612251-02A	1612251-03A
1612251-04A	1612251-05A	1612251-06A
1612251-07A	1612251-08A	1612251-09A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Schreiber Yonley  
 Work Order: 1612251  
 Project: MO UST Site

**QC BATCH REPORT**

Batch ID: R202026 Instrument ID MOIST Method: SW3550C

<b>MBLK</b>	Sample ID: WBLKS-R202026		Units: % of sample				Analysis Date: 12/6/2016 05:39 PM			
Client ID:	Run ID: MOIST_161206E		SeqNo: 4189838		Prep Date:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture ND 0.050

<b>LCS</b>	Sample ID: LCS-R202026		Units: % of sample				Analysis Date: 12/6/2016 05:39 PM			
Client ID:	Run ID: MOIST_161206E		SeqNo: 4189837		Prep Date:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 100 0.050 100 0 100 99.5-100.5 0

<b>DUP</b>	Sample ID: 1612251-02B DUP		Units: % of sample				Analysis Date: 12/6/2016 05:39 PM			
Client ID: PH02 20-21	Run ID: MOIST_161206E		SeqNo: 4189829		Prep Date:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 24.8 0.050 0 0 0 23.81 4.07 20

<b>DUP</b>	Sample ID: 1612251-04B DUP		Units: % of sample				Analysis Date: 12/6/2016 05:39 PM			
Client ID: PH05 19-20	Run ID: MOIST_161206E		SeqNo: 4189832		Prep Date:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 17.55 0.050 0 0 0 18.51 5.32 20

The following samples were analyzed in this batch:

1612251-01B	1612251-02B	1612251-03B
1612251-04B		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Schreiber Yorley  
 Work Order: 1612251  
 Project: MO UST Site

## QC BATCH REPORT

Batch ID: R202121 Instrument ID MOIST Method: SW3550C

MBLK	Sample ID: WBLKS-R202121	Units: % of sample				Analysis Date: 12/7/2016 06:47 PM				
Client ID:	Run ID: MOIST_161207D	SeqNo: 4192160	Prep Date:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	0.03	0.050								J

LCS	Sample ID: LCS-R202121	Units: % of sample				Analysis Date: 12/7/2016 06:47 PM				
Client ID:	Run ID: MOIST_161207D	SeqNo: 4192159	Prep Date:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP	Sample ID: 1612369-09A DUP	Units: % of sample				Analysis Date: 12/7/2016 06:47 PM				
Client ID:	Run ID: MOIST_161207D	SeqNo: 4192152	Prep Date:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	14.09	0.050	0	0	0		14.5	2.87	20	

DUP	Sample ID: 1612369-13A DUP	Units: % of sample				Analysis Date: 12/7/2016 06:47 PM				
Client ID:	Run ID: MOIST_161207D	SeqNo: 4192157	Prep Date:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	17.58	0.050	0	0	0		17.86	1.58	20	

The following samples were analyzed in this batch:

1612251-05B	1612251-06B	1612251-07B
1612251-08B		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.



Cincinnati, OH  
+1 513 733 5336  
Everett, WA  
+1 425 856 2600

Fort Collins, CO  
+1 970 490 1511  
Holland, MI  
+1 616 399 6070

Houston, TX  
+1 281 530 5656  
Middletown, PA  
+1 717 944 5541

Spring City, PA  
+1 610 948 4903  
Salt Lake City, UT  
+1 801 266 7700

South Charleston, WV  
+1 304 336 3168  
York, PA  
+1 717 505 5280

Page 1 of 1  
COC ID: 39912

# Environmental

Customer Information		Project Information	
Purchase Order	Project Name	Parameter/Method Request for Analysis	
Work Order	Project Number		
Company Name	Bill To Company		
Send Report To	Invoice Alt		
Address	Address		
City/State/Zip	City/State/Zip		
Phone	Phone		
Fax	Fax		
e-Mail Address	e-Mail Address		

NO.	Sample Description	Date	Time	Matrix	Pres	Temp	Fluor	Chlor	Mer	Lead	Cadm	Copper	Zinc	Iron	Other	Hold
1	PH 01 20-21	12/1/16	8:45	S	4°C											
2	PH 02 20-21		9:20													
3	PH 04 17-16		10:55													
4	PH 05 19-20		11:30													
5	PH 06 19-20		12:10													
6	PH 07 19-20		1:20													
7	PH 08 19-20		1:40													
8	PH 09 4-5															
9																
10																

Prepared by: <i>[Signature]</i>	Date: 12/1/16	Time: 4:14 PM	Received by: <i>[Signature]</i>	Date: 12/1/16	Time: 9:30
Relinquished by: <i>[Signature]</i>	Date: 12/1/16	Time: 12:00	Received by: <i>[Signature]</i>	Date: 12/1/16	Time: 12:00
Relinquished by: <i>[Signature]</i>	Date: 12/1/16	Time: 12:00	Received by: <i>[Signature]</i>	Date: 12/1/16	Time: 12:00
Relinquished by: <i>[Signature]</i>	Date: 12/1/16	Time: 12:00	Received by: <i>[Signature]</i>	Date: 12/1/16	Time: 12:00
Relinquished by: <i>[Signature]</i>	Date: 12/1/16	Time: 12:00	Received by: <i>[Signature]</i>	Date: 12/1/16	Time: 12:00
Relinquished by: <i>[Signature]</i>	Date: 12/1/16	Time: 12:00	Received by: <i>[Signature]</i>	Date: 12/1/16	Time: 12:00
Relinquished by: <i>[Signature]</i>	Date: 12/1/16	Time: 12:00	Received by: <i>[Signature]</i>	Date: 12/1/16	Time: 12:00
Relinquished by: <i>[Signature]</i>	Date: 12/1/16	Time: 12:00	Received by: <i>[Signature]</i>	Date: 12/1/16	Time: 12:00
Relinquished by: <i>[Signature]</i>	Date: 12/1/16	Time: 12:00	Received by: <i>[Signature]</i>	Date: 12/1/16	Time: 12:00
Relinquished by: <i>[Signature]</i>	Date: 12/1/16	Time: 12:00	Received by: <i>[Signature]</i>	Date: 12/1/16	Time: 12:00

Note: 1. Any changes must be made in writing once samples and COC form have been submitted to ALS Environmental.  
 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.  
 3. The Chain of Custody is a legal document. All information must be completed accurately.

Sample Receipt Checklist

Client Name: SCHREIBERYONLEY - MO

Date/Time Received: 03-Dec-16 09:30

Work Order: 1612251

Received by: MBB

Checklist completed by Meghan Broadbent 05-Dec-16  
eSignature Date

Reviewed by: Alex Cozzan 05-Dec-16  
eSignature Date

Matrices: soil  
Carrier name: FedEx

- Shipping container/cooler in good condition? Yes  No  Not Present
- Custody seals intact on shipping container/cooler? Yes  No  Not Present
- Custody seals intact on sample bottles? Yes  No  Not Present
- Chain of custody present? Yes  No
- Chain of custody signed when relinquished and received? Yes  No
- Chain of custody agrees with sample labels? Yes  No
- Samples in proper container/bottle? Yes  No
- Sample containers intact? Yes  No
- Sufficient sample volume for indicated test? Yes  No
- All samples received within holding time? Yes  No
- Container/Temp Blank temperature in compliance? Yes  No
- Sample(s) received on ice? Yes  No

Temperature(s)/Thermometer(s): 2.2/2.2 SR2

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage: 12/5/2016 12:49:42 PM

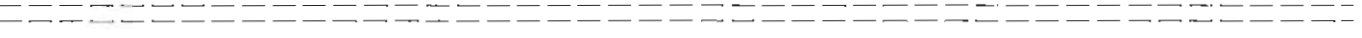
Water - VOA vials have zero headspace? Yes  No  No VOA vials submitted

Water - pH acceptable upon receipt? Yes  No  N/A

pH adjusted? Yes  No  N/A

pH adjusted by:

Login Notes:



Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

**APPENDIX K**

**DEED NOTICE**

University of Missouri-Columbia  
Radioactive Materials Pick Up Request Form

KU Environmental Health and Safety  
Fax: 524-5279

Date of Request: 1-17 Authorized User: Latimer Authorized User Number: 540 Registered User Number: 2015B  
 Person Requesting Pick Up: Bobby Butler Telephone: 301-5493 Building: Cyberdatacom Room: A224 Other: \_\_\_\_\_  
 Physical Form Abbreviations: A = animal (in lb) G = gas (in ft<sup>3</sup>) L = liquid (in gal) S = solid (in ft<sup>3</sup>) STO = stock (in gal) V = vials (in gal) NOTE: Please "any shading equals that are greater than 0.1% weight

RS PU#	Qty	Physical Form & Unit (check one)	Type of Material (Components & Concentrations)	Isotope	Activity (mCi)	Act (mCi)	Cont ID #	Destination			HAND Acq. Date	EQUPTS Document #
								R	R	S		
		<input type="checkbox"/> A (kg) <input checked="" type="checkbox"/> S (ft <sup>3</sup> ) <input type="checkbox"/> G (ft <sup>3</sup> ) <input type="checkbox"/> STO (gal) <input type="checkbox"/> L (gal) <input type="checkbox"/> V (gal)										
	5	<input type="checkbox"/> A (kg) <input checked="" type="checkbox"/> S (ft <sup>3</sup> ) <input type="checkbox"/> G (ft <sup>3</sup> ) <input type="checkbox"/> STO (gal) <input type="checkbox"/> L (gal) <input type="checkbox"/> V (gal)	PPE 07221	I131	0.1							
	5	<input type="checkbox"/> A (kg) <input checked="" type="checkbox"/> S (ft <sup>3</sup> ) <input type="checkbox"/> G (ft <sup>3</sup> ) <input type="checkbox"/> STO (gal) <input type="checkbox"/> L (gal) <input type="checkbox"/> V (gal)	PPE 64714	Su17m	0.1							
	5	<input type="checkbox"/> A (kg) <input checked="" type="checkbox"/> S (ft <sup>3</sup> ) <input type="checkbox"/> G (ft <sup>3</sup> ) <input type="checkbox"/> STO (gal) <input type="checkbox"/> L (gal) <input type="checkbox"/> V (gal)	PPE 07223	I131	0.1							
	5	<input type="checkbox"/> A (kg) <input checked="" type="checkbox"/> S (ft <sup>3</sup> ) <input type="checkbox"/> G (ft <sup>3</sup> ) <input type="checkbox"/> STO (gal) <input type="checkbox"/> L (gal) <input type="checkbox"/> V (gal)	PPE 07225	I131	0.1							
	5	<input type="checkbox"/> A (kg) <input checked="" type="checkbox"/> S (ft <sup>3</sup> ) <input type="checkbox"/> G (ft <sup>3</sup> ) <input type="checkbox"/> STO (gal) <input type="checkbox"/> L (gal) <input type="checkbox"/> V (gal)	Cedar chips 07226	Su17m, Oc1								

I hereby certify that the above information is correct and that the activities have been designed in the date of the Pick Up Request.

Authorized User or Designated Representative \_\_\_\_\_

Date \_\_\_\_\_



**APPENDIX K**  
**DEED NOTICE**

**-STATEMENT OF CLOSURE-  
DEED NOTICE FOR AN IN PLACE CLOSURE OF  
UNDERGROUND STORAGE TANKS**

I, the undersigned officer of THE CURATORS OF THE UNIVERSITY OF MISSOURI ("Owner"), hereby affirm to the Department of Natural Resources, to the best of my knowledge information and belief, as follows:

The Owner closed in place an underground petroleum storage tank (UST) in Boone County, in the State of Missouri.

Pursuant to Title 10, 80-2.030(2) of the Code of State Regulations of Missouri, the Owner has/have closed a solid waste disposal area consisting of 2 underground storage tank(s) (USTs) in Boone County, State of Missouri, and further state the following information required by said regulations:

1 Names of Property Owners as they appear on the last recorded Property deed, and where the property deed is recorded:

Names: The Curators of the University of Missouri

Book Number: 797 Page Number: 230

2 Legal Description of Property:

THE 40 ACRES, THE SOUTH PART OF THE WEST ½ OF THE SOUTHWEST QUARTER OF SECTION 1, TOWNSHIP 48, RANGE 13, WEST OF THE FIFTH PRINCIPAL MERIDIAN IN BOONE COUNTY, MISSOURI. MORE ACCURATELY DESCRIBED AS FOLLOWS; TO-WIT: BEGINNING AT A STONE ON THE NORTH LINE OF THE RIGHT-OF-WAY OF U.S. HIGHWAY #40 AND 20 FEET WEST OF THE NORTH AND SOUTH SUBDIVISION OF THE SOUTHWEST QUARTER OF SECTION 1, TOWNSHIP 48, RANGE 13; THENCE 82 DEGREE AND 53 MINUTES WEST ALONG AND WITH THE NORTH LINE OF THE RIGHT-OF-WAY OF U.S. HIGHWAY #40, 1327 FEET, TO THE SECTION LINE BETWEEN SECTION 1, 2, SAID TOWNSHIP AND RANGE. THENCE NORTH WITH THE SECTION LINE 1324 FEET, THENCE SOUTH 82 DEGREES 53 MINUTES EAST, PARALLEL TO THE NORTH LINE OF THE RIGHT-OF-WAY OF THE U.S. HIGHWAY #40, 1327 FEET TO A POINT ON THE WEST LINE OF A PRIVATE ROAD; THENCE SOUTH AND PARALLEL TO THE NORTH AND SOUTH SUBDIVISION LINE OF THE SOUTHWEST QUARTER OF SECTION 1, TOWNSHIP 48, RANGE 1324 FEET TO THE POINT OF BEGINNING AND CONTAINING 40 ACRES.



# Underground Storage Tank Individual Tank Report

**Facility Id** ST0008099

**Owner Id** OW10242

**DNR Tank ID** 1

## TANK INFORMATION

**Tank Type** Below Ground **Meets 98 Upgrade**  
**Tank Status** Removed **Tank Capacity** 500  
**Date Of Last Use** 12/14/1994 **Tank Material** Steel  
**Date Permanently Closed** 12/14/1994 **Tank Installation Date** 07/07/1975  
**Date Of No Further Action** 12/14/1994  
**Date Administratively Closed**

## TANK PROTECTION INFORMATION

**Tank Internal Protection** **Tank External Protection**  
**Internal Protection Other** **External Protection Other**  
**Internal Protection Date** **External Protection Date**

## Compartment Information

**Compartment #** 1

## PIPING INFORMATION

**Piping System** **Piping Installation Date**  
**Pipe Material** Steel **Pipe Protection**  
**Pipe Material Other** **Pipe Protection Date**

## SUBSTANCE INFORMATION

**Tank Substance** Gasoline, Including Blend **Hazardous Substance**  
**Other Type Of Substance** **CAS Number**  
**Hazardous Mixture** No

## Release Detection

**Spill Protection**

**OverFill** NotRequired

**Tank Release Detection**

**Pipe Release Detection**

**Facility Id** ST0008099

**Owner Id** OW10242

**DNR Tank ID** 2

**TANK INFORMATION**

**Tank Type** Below Ground **Meets 98 Upgrade**  
**Tank Status** Removed **Tank Capacity** 15000  
**Date Of Last Use** 12/14/1994 **Tank Material** Steel  
**Date Permanently Closed** 12/14/1994 **Tank Installation Date** 02/03/1976  
**Date Of No Further Action** 12/14/1994  
**Date Administratively Closed**

**TANK PROTECTION INFORMATION**

**Tank Internal Protection** **Tank External Protection**  
**Internal Protection Other** **External Protection Other**  
**Internal Protection Date** **External Protection Date**

**Compartment Information**

**Compartment #** 1

**PIPING INFORMATION**

**Piping System** **Piping Installation Date**  
**Pipe Material** Steel **Pipe Protection**  
**Pipe Material Other** **Pipe Protection Date**

**SUBSTANCE INFORMATION**

**Tank Substance** Diesel **Hazardous Substance**  
**Other Type Of Substance** **CAS Number**  
**Hazardous Mixture** No

**Release Detection**

**Spill Protection**

**OverFill** NotRequired

**Tank Release Detection**

**Pipe Release Detection**

**Facility Id** ST0008099

**Owner Id** OW10242

**DNR Tank ID** 3

**TANK INFORMATION**

**Tank Type** Below Ground **Meets 98 Upgrade**  
**Tank Status** Removed **Tank Capacity** 15000  
**Date Of Last Use** 12/14/1994 **Tank Material** Steel  
**Date Permanently Closed** 12/14/1994 **Tank Installation Date** 02/03/1976  
**Date Of No Further Action** 12/14/1994  
**Date Administratively Closed**

**TANK PROTECTION INFORMATION**

**Tank Internal Protection** **Tank External Protection**  
**Internal Protection Other** **External Protection Other**  
**Internal Protection Date** **External Protection Date**

**Compartment Information**

**Compartment #** 1

**PIPING INFORMATION**

**Piping System** **Piping Installation Date**  
**Pipe Material** Steel **Pipe Protection**  
**Pipe Material Other** **Pipe Protection Date**

**SUBSTANCE INFORMATION**

**Tank Substance** Diesel **Hazardous Substance**  
**Other Type Of Substance** **CAS Number**  
**Hazardous Mixture** No

**Release Detection**

**Spill Protection**

**OverFill** NotRequired

**Tank Release Detection**

**Pipe Release Detection**



**Facility Id** ST0008099

**Owner Id** OW10242

**DNR Tank ID** 5

**TANK INFORMATION**

**Tank Type** Below Ground **Meets 98 Upgrade**  
**Tank Status** Closed In Place **Tank Capacity** 15000  
**Date Of Last Use** 11/17/2016 **Tank Material** Fiberglass  
**Date Permanently Closed** 11/20/2016 **Tank Installation Date** 09/12/1994  
**Date Of No Further Action** 02/22/2017  
**Date Administratively Closed**

**TANK PROTECTION INFORMATION**

**Tank Internal Protection** **Tank External Protection**  
**Internal Protection Other** **External Protection Other**  
**Internal Protection Date** **External Protection Date**

**Compartment Information**

**Compartment #** 1

**PIPING INFORMATION**

**Piping System** Unsafe Suction **Piping Installation Date** 09/12/1994  
**Pipe Material** Fiberglass(FRP) **Pipe Protection**  
**Pipe Material Other** **Pipe Protection Date** 09/12/1994

**SUBSTANCE INFORMATION**

**Tank Substance** Diesel **Hazardous Substance**  
**Other Type Of Substance** **CAS Number**  
**Hazardous Mixture** No

**Release Detection**

**Spill Protection**

**OverFill** Auto Shutoff  
Ball Valve

**Tank Release Detection** Automatic Tank Gauging\

**Pipe Release Detection** Interstitial



## SECTION 221313

### FACILITY SANITARY SEWERS

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

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

##### 1.2 SUMMARY

- A. Section Includes:
  - 1. Pipe and fittings.
  - 2. Manholes
  - 3. Cleanouts.

##### 1.3 DEFINITIONS

- A. None.

##### 1.4 SUBMITTALS

- A. Product Certificates: For each type of pipe and fitting, from manufacturer.
- B. Shop Drawings: For manholes. Include plans, elevations, sections, details, steps, and frames and covers.
- C. Field quality-control reports.

##### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not store plastic, pipe, and fittings in direct sunlight.
- B. Protect pipe, pipe fittings, and seals from dirt and damage.
- C. Handle manholes according to manufacturer's written rigging instructions.

##### 1.6 PROJECT CONDITIONS

- A. Interruption of Existing Sanitary Sewerage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions:
  - 1. Notify Owner no fewer than five working days in advance of proposed interruption of service.
  - 2. Do not proceed with interruption of service without Owner's written permission.

## PART 2 - PRODUCTS

### 2.1 PVC PIPE AND FITTINGS

#### A. PVC Sewer Piping:

1. Pipe: ASTM D2241, PVC 1120, DR 35, PR 200 (SDR-21), PVC sewer pipe.
2. Joints: ASTM D33033/D3034, Type 1, Grade 1.

### 2.2 CLEANOUTS

#### A. PVC Cleanouts:

1. Description: PVC body with cast iron top as detailed in the civil plans. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping.

### 2.3 CONCRETE

- #### A. General: Per Section 510 of the current City of Columbia Sanitary Sewer Specifications and Standards (see 331313 APPENDIX A).

### 2.4 MANHOLES

#### A. Standard Precast Concrete Manholes:

1. Description: Per Section 510 of the current City of Columbia Sanitary Sewer Specifications and Standards (see 331313 APPENDIX A) and as detailed in the plans.
2. The lid shall be lettered with the words 'Sanitary Sewer'.

## PART 3 - EXECUTION

### 3.1 EARTHWORK

- #### A. Excavating, trenching, and backfilling are specified in Division 31 Section "Earth Moving."

### 3.2 PIPING INSTALLATION

- #### A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground sanitary sewer piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated.
- #### B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements.

- C. Clear interior of piping of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed. Place plug in end of incomplete piping at end of day and when work stops.

### 3.3 PIPE JOINT CONSTRUCTION

- A. Join gravity-flow, nonpressure, drainage piping according to the following:
  - 1. Join PVC sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric-gasket joints.

### 3.4 MANHOLE INSTALLATION

- A. General: Install manholes complete with appurtenances and accessories indicated.
- B. Install precast concrete manhole sections with sealants according to current City of Columbia Sanitary Sewer Specifications (see 331313 APPENDIX A).

### 3.5 CONCRETE PLACEMENT

- A. Place cast-in-place concrete according to ACI 318.

### 3.6 CLEANOUT INSTALLATION

- A. Install cleanouts as detailed in the civil plans.

### 3.7 CONNECTIONS

- A. Connect nonpressure, gravity-flow drainage piping to building's sanitary building drains specified in Division 22 Section "Sanitary Waste and Vent Piping."
- B. Make connections to existing piping and underground manholes.
  - 1. Per current City of Columbia Sanitary Sewer Construction specifications and details (see 331313 APPENDIX A).

### 3.8 IDENTIFICATION

- A. Materials and their installation are specified in Division 31 Section "Earth Moving." Arrange for installation of green detectable warning tapes directly over piping.

### 3.9 FIELD QUALITY CONTROL

- A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches (600 mm) of backfill is in place, and again at completion of Project.

1. Inspect and test per Section 515 of the current City of Columbia Sanitary Sewer Specifications and Standards (see 331313 APPENDIX A).
  2. Submit separate report for each system inspection.
  3. Defects requiring correction include the following:
    - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
    - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
    - c. Damage: Crushed, broken, cracked, or otherwise damaged piping.
    - d. Infiltration: Water leakage into piping.
    - e. Exfiltration: Water leakage from or around piping.
    - f. Any other defect determined by the Owner.
  4. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
  5. Reinspect and repeat procedure until results are satisfactory.
- B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
1. Do not enclose, cover, or put into service before inspection and approval.
  2. Test completed piping systems according to requirements of authorities having jurisdiction.
  3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
  4. Submit separate report for each test.
  5. Air Tests: Test sanitary sewerage according to requirements of authorities having jurisdiction.
- C. Leaks and loss in test pressure constitute defects that must be repaired.
- D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.
- 3.10 CLEANING
- A. Clean dirt and superfluous material from interior of piping. Flush with potable water.

END OF SECTION 221313

**SECTION 26 0500  
COMMON WORK RESULTS FOR ELECTRICAL**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. This Section specifies the basic requirements for electrical installations and includes requirements common to all sections of Division 26 and 33. It expands and supplements the requirements specified in sections of Division 00.
- B. Drawings and general provisions of the Contract, including general and supplementary conditions and specification sections Divisions 1, 26, and 33, apply to this Section.
- C. Codes and Standards: All equipment, material and installations shall comply with applicable codes, standards, and installation practices. Comply with the requirements of the applicable local building codes, the applicable NEC, all local rules and regulations including those of the fire authorities. Comply with all applicable NFPA standards. All material and equipment shall be listed by the Underwriters Laboratories (UL) standard that is applicable for the specific purpose of the material and equipment. The National Electrical Code, National Electrical Manufacturer's Association (NEMA) Standards, and applicable ANSI and IEEE standards shall apply to the pertinent materials, equipment, and installation practices. Testing shall be in accordance with the applicable International Electrical Testing Association (NETA) standards.
  - 1. These specifications include references to the 2020 edition of the NFPA 70 "National Electrical Code." Where a different edition of the NEC has been adopted by the local Authority Having Jurisdiction, the references associated with that edition of the Code shall be applicable.

**1.2 SUMMARY OF WORK**

- A. The word "furnish" means supply for use, the word "install" means install in its proper location and connect up complete and ready for operation, and the word "provide" means to furnish and install.
- B. Provide all new materials as indicated on the drawings and specifications and all items required to make the electrical system complete and in working order.
- C. System descriptions included in scope of work are as follows:
  - 1. Electrical power distribution service from the local utility, Columbia Water and Light.
  - 2. Selective demolition work and modification of existing systems and equipment.

**1.3 WORK SEQUENCE**

- A. All work that produces excessive noise or interference with normal building operations shall be coordinated and scheduled with the Owner. Such work may require scheduling of work after occupied hours or weekends. The Owner reserves the right to determine when such work is conducted.

## 1.4 QUALITY ASSURANCE

- A. Responsibility Prior to Submitting Pricing or Bid Data:
1. Thoroughly review the contract documents and specifications and visit the site prior to issuing bid. Resolve all reported deficiencies with the Engineer prior to awarding any subcontracts, ordering material, or starting any work.
- B. Qualifications:
1. Only products of specified manufacturers, or approved equals as determined by the Engineer, are acceptable.
  2. Employ only workmen who are skilled in their trades.
- C. Compliance with Codes, Laws, and Ordinances:
1. Conform to all requirements of the state, city and local codes, laws and ordinances and other regulations having jurisdiction over this installation.
  2. If there are any discrepancies between the codes and regulations and these specifications, the Engineer shall determine the method or equipment to be used.
  3. Inform the Engineer in writing, requesting a clarification at the time of the bidding, if any parts of the drawings or specifications are found not to comply with the codes or regulations. Submit a separate price to make the system comply if there is insufficient time for this procedure.
  4. Inform the Engineer in writing requesting a clarification if there is any discrepancy between a manufacturer's recommendation and these specifications.
  5. Follow the current issue of NFPA 70 "National Electrical Code" if there are no local codes having jurisdiction.
- D. Examination of Drawings:
1. The drawings for the indicated work are diagrammatic, intended to convey the scope of the electrical work and to indicate the general arrangements and locations of equipment, etc., and the approximate sizes of equipment. Field verification of dimensions on plans is required. The actual conditions, including lengths and orientation shall be the basis of the work.
  2. The electrical drawings and specifications shall be considered as mutually explanatory and complementary. Any electrical work called for by one and not by the other shall be performed as though required by all. All sections and subsections of the Electrical work shall be governed by and subject to the general and supplementary conditions. Report any discrepancies in or between the drawings and specifications, or between the drawings and actual field conditions to the Engineer in sufficient time to issue an addendum for clarification.
  3. Do not scale drawings to determine equipment and system locations.
  4. Any item either shown on the drawings or called for in the specifications shall be included in this contract.
  5. Determine quantities and quality of material and equipment required from the documents. Provide the more expensive or higher quality amount where discrepancies arise among drawings, schedules or specifications.
- E. Electronic Media and Files:
1. Electronic media files of the contract drawings in AutoCAD or PDF format and copies of the specifications in PDF format may be requested.

2. Complete and return a signed "Electronic File Transmittal" form provided by Ross & Baruzzini upon request for electronic media,
3. Obtain approval from the appropriate Design Professional for use of their part of the documents if the information requested includes information prepared by other than Ross & Baruzzini.
4. The electronic contract documents may be used for preparation of shop drawings and record drawings only. The information may not be used in whole or in part for any other project.
5. The drawings prepared by Ross & Baruzzini for bidding purposes may not be used directly for raceway layout drawings or coordination drawings.
6. The use of these documents does not allow relief from the responsibility for coordination of work with other trades and verification of space available for the installation.
7. The information is provided to expedite the project with no guarantee by Ross & Baruzzini as to the accuracy or correctness of the information provided. Ross & Baruzzini accepts no responsibility or liability for the use of the provided information.

## **1.5 PRODUCT OPTIONS AND MATERIAL SUBSTITUTIONS**

- A. Where two or more materials are listed in the "Part 2 – Products" subsection of any Division 26 and 33 section, do not assume that the selection of materials is an option. Refer to "Part 3 – Execution" subsection of that same specification section for an explanation of which specific material(s) shall be used for which specific application(s). For example, Part 2 may list several types and grades of conductors, and Part 3 will describe which type and grade of conductors to use for a given application.
- B. When two or more items of same material or equipment are required they shall be of the same manufacturer. Product manufacturer uniformity does not apply to raw materials, bulk materials, wire, conduit, fittings, sheet metal, steel bar stock, welding rods, solder, fasteners, motors for dissimilar equipment units, and similar items used in Work except as otherwise indicated.
- C. Provide products which are compatible within systems and other connected items.
- D. Substitutions: Products other than those specified must be submitted, approved and secured in writing from the Engineer via Addendum. If requested, a sample of the proposed substitution must be submitted to the Engineer for evaluation. This sample shall be supplied at no cost to the Engineer, and will be returned to the submitter, at the submitter's expense at the end of the evaluation period.
- E. Where several manufacturers' names are given, the manufacturer for which a catalog number is given is the basis of design and establishes the quality required.
- F. Any material, article or equipment of other unnamed manufactures which will adequately perform the services and duties imposed by the design and is of a quality equal to or better than the material, article or equipment identified by the drawings and specifications may be used if approval is secured in writing from the Engineer via Addendum. Assume all costs incurred as a result of using the offered material, article or equipment, including the part of other Divisions whose work is affected.
- G. Voluntary add or deduct prices for alternate materials may be listed on the bid form. These items will not be used in determining the low bidder. Assume all costs incurred as a result of using the offered material or equipment on his part or on the part of other Divisions whose work is affected.

- H. All material substitutions requested after the final Addendum must be listed as voluntary changes on the bid form.

## **1.6 MISCELLANEOUS MATERIALS**

- A. Miscellaneous Materials Include:
  - 1. Miscellaneous metals for support of electrical materials and equipment.
  - 2. Wood grounds, nailers, blocking, fasteners and anchorage for support of electrical materials and equipment.
  - 3. Concrete bases for equipment.
  - 4. Sealers for sealing around electrical materials and equipment; and for sealing penetrations in floors and walls.

## **1.7 WARRANTIES**

- A. Refer to the Division 1 "Closeout Procedures" for procedures and submittal requirements for warranties. Refer to individual equipment specifications for warranty requirements.
- B. Compile and assemble the warranties specified in Divisions 26 into an electronic file format.
- C. Warranty requires correction of all work found to be defective or nonconforming to the Contract Documents, without cost to the Owner. Bear all costs associated with corrective measures and damage due to defects or nonconformance with the Contract Documents, excluding repairs required as a result of improper maintenance or operation, or normal wear and tear as determined by the Engineer.

## **PART 2 - PRODUCTS**

### **2.1 GROUT**

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, non-staining, mixed with water to consistency suitable for application and a 30-minute working time and recommended for interior and exterior applications.

## **PART 3 - EXECUTION**

### **3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION**

- A. Comply with NECA 1.
- B. Jobsite Safety: The Contractor is the sole entity responsible for jobsite safety.

### **3.2 EXCAVATION, FILL, BACKFILL, COMPACTION, AND RESTORATION**

- A. General:
  - 1. Prior to any excavation or digging, verify all underground utility locations. Contact all location services with sufficient time allowance for completion of utility location documentation.
  - 2. Unless noted otherwise provide all excavation, fill, backfill, compaction and restoration required for the scope of work.



B. Excavation:

1. Excavations shall be made to proper dimensions and to accurate, solidate and undisturbed earth.
2. Provide all excavations that exceed the depth requirements with concrete of the same characteristics for foundations or compacted sand gravel fill. The type of fill shall be determined by the Engineer.
3. Do not damage surrounding structures, equipment or buried pipe. Do not undermine footing or foundation.
4. Protect all excavations to prevent cave-ins and risk to workmen.
5. Saw-cut pavement or concrete surfaces where required for excavation with clean edges.
6. Notify Engineer if bearing soil is not found to be adequate and halt excavation operation until given direction from the Engineer.
7. Confirm the soil conditions at their own cost. Excavations shall be conducted as required in the documents.
8. A compacted bed of sand and gravel (minimum of 3 inches deep) shall be provided where trench is excavated in rock.

C. Dewatering:

1. All trenches and pits shall be kept free of accumulation of water. Provide all required equipment.

D. Underground Obstructions:

1. The electrical drawings do not necessarily show all underground piping, conduit, feeders, foundations, and other obstructions in the vicinity of the construction. Review the documents of all Divisions to determine other obstructions. Take applicable precautions in making installations near underground obstructions.
2. If objects not indicated on the drawings are encountered, remove, relocate or perform extra work as indicated by the Engineer.

E. Fill and Backfilling:

1. Furnish all necessary sand and material for backfilling. Waste material and garbage are not acceptable materials.
2. Remove excess excavated earth as directed.
3. Backfill materials shall be suitable for required compaction, clean and free of perishable materials, frozen earth, debris, earth with a high void content, and stones greater than 4 inches in diameter. Water is not permitted to remain in un-backfilled trenches.
4. All trenches and excavations shall be backfilled immediately after completion of conduit installation or forms removal unless otherwise noted.
5. Areas around piers, independent foundations or structures shall have backfilled on all sides to prevent displacement. Fill and backfill shall be spread uniformly.
6. All conduits that are not concrete encased shall be provided with a bed of a minimum of 3 inches depth of compacted sand. Backfill shall be provided with compacted layers above the conduits.
7. Provide sand backfill to grade for all conduits under slabs or paved areas. All other conduits shall have sand backfill to 6 inches above the top of the conduit.
8. Backfill shall be made in layers of sand not exceeding 6 inches in depth.
9. Protect surface to prevent loads from the top of the surface for a minimum of 48 hours after backfilling operation.

F. Surface Restoration:

1. Areas shall be restored to the original condition, including areas that are landscaped. Replace all planting and landscaping features removed or damaged to its original condition. At least 6 inches of topsoil shall be applied where disturbed areas are to be seeded or sodded. All lawn areas shall be sodded unless seeding is called out in the drawings or specifications.
2. Concrete or asphalt type pavement and other surfaces removed or damaged shall be replaced to original condition. Broken edges shall be saw cut and repaired as directed by Engineer.

**3.3 PROJECT CLOSEOUT**

A. The following paragraphs supplement the requirements of Division 1:

B. Final Jobsite Observation:

1. Certify that the project jobsite is ready for the final jobsite observation.

END OF SECTION 26 0500

**SECTION 26 0519  
CONDUCTORS AND CABLES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Conductors and Cables.

**1.3 SUBMITTALS**

- A. Submittals for approval by the Engineer are not required for this section. Unrequested submittals will not be processed or reviewed. Non-requirement of submittals is not to be construed as an allowance for substitutions and does not allow relief from full compliance with the contract documents.

**1.4 QUALITY ASSURANCE**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70 "National Electrical Code."
  - 1. Conform to applicable codes and regulations regarding toxicity of combustion products of insulating materials.
- C. UL Compliance: Provide components which are listed and labeled by Underwriters Laboratories under the following standards.
  - 1. UL Std. 83 Thermoplastic-Insulated Wires and Cables.
  - 2. UL Std. 486A Wire Connectors and Soldering Lugs for Use with Copper Conductors.
- D. NEMA and ICEA Compliance: Provide components which comply with the following standards:
  - 1. WC-70: Power Cables Rated 2,000V or Less for the Distribution of Electrical Energy.
- E. IEEE Compliance: Provide components which comply with the following standard.
  - 1. Std. 82: Test procedures for Impulse Voltage Tests on Insulated Conductors.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. American Insulated Wire Corp.; a Leviton Company.
  - 2. General Cable Corporation.
  - 3. Senator Wire & Cable Company.
  - 4. Southwire Company.
  - 5. Cerro Wire.
  - 6. Superior Essex.
- B. Copper Conductors: Comply with NEMA WC 70.
- C. Conductor Insulation: Comply with NEMA WC 70 for Types THHN-THWN.

### **2.2 CONDUCTORS AND CABLES**

- A. General: Provide wire and cable suitable for the temperature, conditions and location where installed.
- B. Feeders: Copper, 600 volt insulation. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- C. Branch Circuits: Copper, 600 volt insulation. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- D. Control Circuits: Copper, stranded conductor, 600 volt insulation.
- E. Single Conductors for Feeders and Branch Circuits:
  - 1. Stranding: Provide solid conductors for branch circuits and non-vibrating power utilization equipment utilizing Number 10 AWG and smaller. Provide stranded conductors for Number 8 AWG and larger. Provide stranded conductors, regardless of size, for connections to vibrating equipment such as motors and transformers.

### **2.3 CONNECTORS AND SPLICES**

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. AFC Cable Systems, Inc.
  - 2. Hubbell Power Systems, Inc.
  - 3. O-Z/Gedney; EGS Electrical Group LLC.
  - 4. 3M; Electrical Products Division.
  - 5. Tyco Electronics Corp.
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type and class for application and service required.

## **PART 3 - EXECUTION**

### **3.1 CONDUCTOR INSULATION, APPLICATIONS AND WIRING METHODS**

- A. Concealed below Underground: Type THWN, single conductors in raceway.
- B. Exposed, Including in Crawlspace: Type THHN-THWN, single conductors in raceway.

### **3.2 DEVIATION FROM CONTRACT DRAWINGS**

- A. Basis of Design is copper conductors installed in raceway, based on 30 degrees C ambient temperature (NEC Table 310.15(B)(16)). If materials or methods selected for installation differ from the basis of design, this contractor shall be responsible for sizing conductors and conduits to meet or exceed the ampacity of circuits selected for the basis of design.
- B. Routing multiple conductors within a single conduit requires the conductor ampacity to be derated per National Electrical Code Article 310. Do not provide more than 4 conductors within a single conduit.
- C. Underground duct conductor ampacity is based on table B.310.15(B)(2)(7) of the National Electrical code, or has been calculated in accordance with Informative Annex B: Application Information for Ampacity Calculation. Deviation from the contract documents in regard to conductor and conduit quantities or orientation as suggested by the Contractor shall require supporting calculations and a sketch for Engineer approval.
- D. Where ungrounded conductors are increased in size for any reason, equipment grounding conductors shall be increased in size proportionally according to the circular mil area of the ungrounded conductors.

### **3.3 INSTALLATION OF CONDUCTORS AND CABLES**

- A. Install products in accordance with manufacturer's instructions.
- B. Completely and thoroughly swab raceway before installing wire.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means including fish tape, cable, rope, and basket weave wire and cable grips which will not damage cables or raceways. Do not use rope hitches for pulling attachment to wire or cable. Do not exceed maximum tensile strength of conductor or grip. Do not exceed maximum sidewall pressure limitations of cables.
- E. Pull conductors simultaneously where more than one is being installed in the same raceway.
- F. Feeder conductors shall be continuous and shall not contain splices.
- G. Provide adequate length of conductors within electrical enclosures and train the conductors to terminal points with no excess. Bundle multiple conductors, with conductors larger than Number 10 AWG cabled in individual circuits. Make terminations so there is no more than 1/8 inch of exposed bare conductor at the terminal. Observe NEC 310.15 (B)(2)(a) adjustment factors.

- H. Use conductor not smaller than Number 12 AWG for power and lighting circuits.
- I. Use Number 10 AWG conductors (phase, neutral and ground) for 20 ampere, 120 volt branch circuits longer than 75 feet, unless drawings requirements are more stringent.
- J. Use Number 10 AWG conductors (phase, neutral and ground) for 20 ampere, 277 volt branch circuits longer than 200 feet, unless drawings requirements are more stringent.
- K. Place an equal number of conductors for each phase, neutral and ground of a circuit within the same raceway or cable when routing parallel conductors. Conductor lengths must be equal.
- L. Support cables according to Division 26 Section "Hangers and Supports."
- M. Identify and color-code conductors and cables according to Division 26 Section "Identification for Electrical Systems."

### **3.4 CONNECTIONS AND TERMINATIONS**

- A. Tighten electrical connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL 486A.
- B. Clean conductor surfaces before installing lugs and connectors.
- C. Utilize solderless compression terminals applied with circumferential compression for conductor sizes 8 AWG and larger and crimp in accordance with manufacturer instructions. Indenter compression method may be used for conductor sizes 10 AWG and smaller.
- D. Phase Sequence: Connections to phase conductors at electrical equipment shall be made such that the A-B-C conductors, when facing the equipment, are oriented top to bottom, or left to right.

### **3.5 SPLICES AND TAPS**

- A. Conductor splices shall be kept to a minimum.
- B. Only splice within accessible junction boxes or enclosures.
- C. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors. Splices and taps shall be capable of carrying the full ampacity of the conductors without perceptible temperature rise.
- D. Below Grade:
  - 1. Use specified insulated connectors suitable and approved for below grade wiring connectors. Ensure that conductors do not apply tension to splice.

### **3.6 FIELD QUALITY CONTROL**

- A. Inspect wire for physical damage and proper connection.

- B. Measure tightness of bolted connections with properly scaled and calibrated torque tool and compare torque measurements with manufacturer's recommended values.
- C. Before energizing, test wires and cables for electrical continuity and for short circuits.
- D. Remove and replace malfunctioning conductors and retest as specified above.

END OF SECTION 26 0519

**SECTION 26 0526  
GROUNDING AND BONDING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes solid grounding of electrical systems and equipment. It includes basic requirements for grounding for protection of life, equipment, circuits and systems. Grounding requirements specified in this Section may be supplemented in other sections of these Specifications.

**1.3 QUALITY ASSURANCE**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.
- C. Listing and Labeling: Provide products specified in this Section that are listed and labeled for the specific purposes by Underwriters Laboratories.
- D. Testing Agency Qualifications: Member Company of NETA or an NRTL.
  - 1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.

**PART 2 - PRODUCTS**

**2.1 GROUNDING AND BONDING PRODUCTS**

- A. Products: Of types indicated and of sizes and ratings to comply with NEC. Where types, sizes, ratings and quantities indicated are in excess of NEC requirements, the more stringent requirements and the greater size, rating, and quantity indications govern.

**2.2 CONDUCTORS**

- A. General: Comply with Division 26 Section "Conductors and Cables" for insulated grounding conductors. Conform to NEC Table 8, except as otherwise indicated, for conductor properties, including stranding.
- B. Equipment Grounding Conductor: Green insulated; conductor metal shall match branch circuit conductor metal.
- C. Grounding Electrode Conductor: Stranded cable.



## **2.3 CONNECTORS**

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Exothermic Welded Connections: Provided in kit form and selected for the specific types, sizes, and combinations of conductors and other items to be connected.

## **2.4 GROUNDING ELECTRODES**

- A. Ground Rods: Copper-clad steel
  - 1. Size: 3/4 inch diameter by 10 feet length.

# **PART 3 - EXECUTION**

## **3.1 INSTALLATION**

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Route grounding electrode conductors within rigid polyvinyl chloride (PVC) conduit.

## **3.2 GROUNDING ELECTRODES**

- A. Ground Rods: Provide a minimum of two ground rods separated no less than 20 feet from each other.
  - 1. Drive rods until tops are 2 inches (50 mm) below final grade unless otherwise indicated.
  - 2. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any. Utilize exothermic welds where ground rods are not provided within test wells.
- B. Utility Metering Equipment: Provide bonding conductor at utility company metering equipment per utility company requirements.

## **3.3 EQUIPMENT GROUNDING**

- A. Equipment Grounding Conductor Application: Comply with NEC Article 250 for sizes and quantities of equipment grounding conductors, except where larger sizes or more conductors are indicated.
- B. Install separate insulated equipment grounding conductors with all feeders and branch circuit conductors. Terminate each end on a grounding lug or bus.

## **3.4 BONDING**

- A. Separately Derived Systems: Where the NEC requires separately derived systems to be grounded, provide grounding in accordance with the NEC.

- B. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
  - 1. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

### **3.5 CONNECTIONS**

- A. General: Select connectors, hardware and conductors and make connections in such a manner as to minimize possibility of galvanic action or electrolysis.
  - 1. Make connections with clean bare metal at points of contact.
  - 2. Exothermic Welded Connections or Compression-type Connections: Use for connections for underground connections. Install at connections to ground rods. Comply with manufacturer's written recommendations. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable. Compression connections should be inspected for visible die index number matching the die and connector used. Connections that do not show this are not acceptable.
- B. Conductor Terminations and Connections:
  - 1. Underground Connections: Exothermic-welded or compression-type connectors.
- C. Equipment Grounding Conductors: Terminate insulated equipment grounding conductors for feeders and branch circuits with pressure-type grounding lugs.
- D. Tighten grounding and bonding connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values for connectors and bolts. Where manufacturer's torquing requirements are not indicated, tighten connections to comply with torque tightening values specified in UL 486A
- E. Compression-Type Connections: Use hydraulic compression tools of at least 14-ton size to provide the correct circumferential pressure for compression connectors. Use tools and dies recommended by the manufacturer of the connectors. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on the ground conductor.

### **3.6 FIELD QUALITY CONTROL**

- A. Tests and Inspections: After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements:
  - 1. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
  - 2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal at individual ground rods. Make tests at ground rods before any conductors are connected.
    - a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
    - b. Perform tests by fall-of-potential method according to IEEE 81.

3. Prepare dimensioned drawings locating each ground rod assembly. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.
4. Maximum Ground Resistance Values:
  - a. Service neutral to reference ground: 5 Ohms
  - b. Equipment rated 500 kVA and Less: 10 Ohms.
5. Where resistance to ground exceeds specified values, notify Engineer and include recommendations to reduce ground resistance.

### **3.7 SURFACE RESTORATION**

- A. Restore surface features at areas disturbed by excavation and reestablish original grades except as otherwise indicated. Where sod has been removed, replace it as soon as possible after backfilling is completed. Restore areas disturbed by trenching, storing of dirt, cable laying, and other Work to their original condition. Include necessary topsoil, fertilizing, liming, seeding, sodding, sprigging or mulching. Perform such Work in accordance with Division 32. Maintain disturbed surfaces. Restore vegetation in accordance with the requirements of that Division. Restore disturbed paving as indicated.

END OF SECTION 26 0526

**SECTION 26 0529  
HANGERS AND SUPPORTS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Construction requirements for concrete bases.

**1.3 DEFINITIONS**

- A. EMT: Electrical metallic tubing.
- B. RMC: Rigid metal conduit.
- C. RNC: Rigid non-metallic conduit.
- D. Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of four times the applied force.

**1.4 SUBMITTALS**

- A. Submittals for approval by the Engineer are not required for this section. Unrequested submittals will not be processed or reviewed. Non-requirement of submittals is not to be construed as an allowance for substitutions and does not allow relief from full compliance with the contract documents.

**1.5 QUALITY ASSURANCE**

- A. Comply with NFPA 70.
- B. Electrical components shall be listed and labeled for the specific intended purpose by Underwriters Laboratories, Inc.
- C. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

**1.6 COORDINATION**

- A. Coordinate size, shape and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement and formwork requirements are specified in Division 03.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
  - 1. Slotted Metal Angle and U-Channel Systems:
    - a. Allied Tube & Conduit.
    - b. American Electric.
    - c. B-Line Systems, Inc.
    - d. GS Metals Corp.
    - e. Unistrut Diversified Products.

### **2.2 COATINGS**

- A. Coating: Supports, support hardware, and fasteners shall be protected with zinc coating or with treatment of equivalent corrosion resistance using approved alternative treatment, finish or inherent material characteristic.

### **2.3 MANUFACTURED SUPPORTING DEVICES**

- A. Raceway Supports: Clevis hangers, riser clamps, conduit straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets and spring steel clamps.
- B. Fasteners: Types, materials and construction features as follows:
  - 1. Toggle Bolts: All steel springhead type.
  - 2. Through Bolts: Structural type, hex head, high strength. Comply with ASTM A 325.
- C. U-Channel Systems: 16-gauge steel channels, with 9/16-inch-diameter holes, between one and one half and two and one half inches on center, in top surface. Provide fittings and accessories that mate and match with U-channel and are of the same manufacture.

### **2.4 FABRICATED SUPPORTING DEVICES**

- A. General: Shop- or field-fabricated supports or manufactured supports assembled from U-channel components.
- B. Steel Brackets: Fabricated of angles, channels and other standard structural shapes. Connect with welds and machine bolts to form rigid supports.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Install supporting devices to fasten electrical components securely and permanently in accordance with NEC requirements.
- B. Coordinate with the building structural system and with other disciplines' installations.
- C. Raceway Supports: Comply with the NEC and the following requirements:

1. Conform to manufacturer's recommendations for selection and installation of supports.
  2. Miscellaneous Supports: Support miscellaneous electrical components as required to produce the same structural safety factors as specified for raceway supports. Install metal channel racks for mounting cabinets, panelboards, disconnects, control enclosures, pull boxes, junction boxes, transformers and other devices.
  3. channels to support flush-mounted cabinets and panelboards in stud walls.
- D. Ensure that the load applied to any fastener does not exceed 25 percent of the proof test load. Use vibration- and shock-resistant fasteners for attachments to concrete slabs.
1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions and directions furnished with items to be embedded.
  2. Install anchor bolts to elevations required for proper attachment to supported equipment.
  3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

### **3.2 PAINTING**

- A. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 26 0529

## SECTION 26 0533

### RACEWAYS

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

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

##### 1.2 SUMMARY

- A. This Section includes the following raceways electrical wiring:
  - 1. Metallic Conduit and Tubing.
  - 2. Non-Metallic Conduit and Tubing.

##### 1.3 DEFINITIONS

- A. RMC: Rigid metallic conduit
- B. RNC: Rigid nonmetallic conduit.

##### 1.4 SUBMITTALS

- A. Submittals for approval by the Engineer are not required for this section. Unrequested submittals will not be processed or reviewed. Non-requirement of submittals is not to be construed as an allowance for substitutions and does not allow relief from full compliance with the contract documents.

##### 1.5 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70 "National Electrical Code" for components and installation.
- C. Comply with NECA "Standard of Installation."
- D. Listing and Labeling: Provide products specified in this Section that are listed and labeled by Underwriters Laboratories for the specific purpose and comply with the following standards:
  - 1. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
  - 2. ANSI C80.3 - Electrical Metallic Tubing, Zinc Coated.

3. ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
4. ANSI C80.5 – Aluminum Rigid Conduit.
5. ANSI/NFPA 70 - National Electrical Code.
6. ANSI/NEMA FB 1 – Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing and Cable.
7. NECA "Standard of Installation."
8. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
9. NEMA TC 2 - Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80).
10. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.
11. NEMA TC 6 - PVC and ABS Plastic Utilities Duct for Underground Installation.
12. NEMA TC 9 – Fittings for PVC Plastic Utilities Duct for Underground Installation.

## **PART 2 - PRODUCTS**

### **2.1 GENERAL REQUIREMENTS**

- A. Provide conduit, tubing and fittings of types, grades, sizes and weights (wall thicknesses) for each service indicated. Where types and grades are not indicated, provide proper selection determined by installer to fulfill wiring requirements, and comply with applicable portions of NFPA 70 for raceways.
- B. Bushings: Bushings for terminating conduits smaller than 1-1/4 inches are to have flared bottom and ribbed sides, with smooth upper edges to prevent injury to cable insulation. Install insulated type bushings for terminating conduits 1-1/4 inches and larger. Upper edge to have phenolic insulating ring molded into bushing. Bushings to have screw type grounding terminal.
- C. Raintight Sealing Hubs: Two piece type with outer internally-threaded hub to receive conduit, inner locking ring with bonding screw, insulated throat, and V-shaped ring or O-ring.
- D. Conduit sealing bushings for service entrances: OZ Gedney conduit sealing bushings.

### **2.2 METAL CONDUIT AND TUBING**

- A. Rigid Steel (Metallic) Conduit:
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Allied Tube & Conduit.
    - b. LTV Steel Tubular Products Company.
    - c. O-Z Gedney.
    - d. Wheatland Tube Company.



2. Description: Conduit to be seamless, hot dipped galvanized rigid steel. Threads to be cut and ends chamfered prior to galvanizing. Galvanizing to provide zinc coating fused to inside and outside walls of conduit. Provide an enamel lubricating coating on the inside of the conduit. Conduit to conform to ANSI C80.1 and listed and labeled under UL 6.
3. Fittings and Conduit Bodies: NEMA FB 1, single piece threaded, cadmium plated malleable iron.
4. Joint Compound: Listed for use in cable connector assemblies, and compounded for use to lubricate and protect threaded raceway joints from corrosion and enhance their conductivity.

B. Aluminum Rigid Conduit:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Allied Tube & Conduit.
  - b. LTV Steel Tubular Products Company.
  - c. O-Z Gedney.
  - d. Wheatland Tube Company.
2. Description: Conduit to be seamless, 6063 alloy, T-1 temper. Conduit to conform to ANSI C80.5 and listed and labeled under UL 6a.
3. Fittings and Conduit Bodies: Comprised of same alloy. Provide listed antioxidant joint compound per manufacturer's written recommendations.

## 2.3 NONMETALLIC CONDUIT AND TUBING

A. Rigid Non-Metallic Conduit:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Cantex.
  - b. J.M. Manufacturing.
  - c. Allied Tube & Conduit.
  - d. Lamson & Sessions; Carlon Electrical Products.
2. Description: Conduit to be PVC, Schedule 40, rated for use with 90 degrees C conductors and suited for direct burial and above ground use in direct sunlight, whether encased in concrete or not. Conduit to conform to latest edition of ASTM F512, NEMA TC-2, and be listed and labeled under UL 651.
3. Fittings and Conduit Bodies: Manufactured per NEMA TC-3 and UL 651 listed to match conduit, type and material. Expansion fittings shall allow for six inch movement, and shall be similar to Carlon E945 series. Patch and seal all joints,

nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer.

### **PART 3 - EXECUTION**

#### **3.1 METALLIC AND NON-METALLIC CONDUIT APPLICATION**

- A. Outdoor Locations Above Grade; Aluminum Rigid Conduit unless otherwise noted on plans.
- B. Underground:
  - 1. Within 5 feet-0 inches of the building perimeter: RNC.
  - 2. Greater than 5 feet-0 inches of the building perimeter: RNC.
- C. Conduit Size: Conduits shall be sized as shown on drawings. Where conduit sizes are not indicated, conduits shall be sized in accordance with the latest version of the National Electrical Code (NFPA 70) and shall be limited to a 40 percent conductor fill percentage. Conductor ampacities must be maintained; therefore adjustment factors for temperature and quantity derating values must be observed.
  - 1. Minimum Conduit Size: Unless otherwise noted, **1 inch**.

#### **3.2 METALLIC AND NON-METALLIC CONDUIT INSTALLATION**

- A. General Installation Requirements
  - 1. Conduits shall be mechanically and electrically continuous from source of current to all outlets unless a properly sized grounding conductor is routed within the conduit. All metallic conduits shall be bonded per NFPA 70.
  - 2. Do not reduce the indicated sizes of raceways. Conduit sizes may only change junction and pull boxes.
  - 3. Complete raceway installation before starting conductor installation.
  - 4. Use temporary closures to prevent foreign matter from entering raceway.
  - 5. Avoid moisture traps; provide junction box with drain fitting at low points in raceway system.
  - 6. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than **200-lb (90-kg)** tensile strength. Leave at least **12 inches (300 mm)** of slack at each end of pull wire. Empty raceways shall be labeled at each end indicating origin of the raceway. Labels shall be self-adhesive vinyl labels.
- B. Conduit Routing:
  - 1. In general, conduit shall be exposed within unfinished spaces (such as mechanical and utility areas).

2. Raceway routing proposed on Drawings is diagrammatic in nature and shown in approximate locations unless dimensioned. Coordinate conduit routing with beams, joists, columns, windows, etc., as required to complete wiring system. Verify field measurements, routing and termination locations of raceway with obstructions and other trades prior to rough-in. The electrical contractor shall be responsible for any expense due to the failure of coordination between other trades to ensure fit and avoid conflict.
3. Do not install aluminum conduits in contact with concrete.

C. Conduit Supports:

1. Install raceways level and square and at proper elevations. support using conduit rack. Construct rack using steel channel. All conduit supports shall be secured to steel channel members.
2. Support raceways as specified in Division 26 Section "Hangers and Supports."

D. Conduit Fittings and Terminations:

1. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
2. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.
3. Install raceway sealing fittings according to the manufacturer's written instructions. Locate fittings at suitable, approved, accessible locations and fill them with UL-listed sealing compound..

<b>Raceway Material</b>	<b>Outdoors and non-conditioned areas</b>
Steel	One expansion fitting in runs longer than 40 feet, additional expansion fittings every 200 feet
Aluminum	One expansion fitting in runs longer than 20 feet, additional expansion fittings every 100 feet
PVC	One expansion fitting in runs longer than 10 feet, additional expansion fittings every 50 feet

4. Avoid use of dissimilar metals throughout system to eliminate possibility of electrolysis. Where dissimilar metals are in contact, coat surfaces with corrosion inhibiting compound before assembling.

E. Conduit Bends:

1. Install no more than the equivalent of three 90-degree bends in any conduit run except for communications conduits, for which fewer bends are allowed.
2. Make bends and offsets so the inside diameter is not reduced. Unless otherwise indicated, keep the legs of a bend in the same plane and the straight legs of offsets parallel.
3. Stub-Up Connections: Use type of conduit described for stub-ups from slab. Extend conduit through concrete floor for connection to freestanding equipment to a distance 6-inches above the floor. Arrange stub-ups so curved portions of bends are not visible above the finished slab.

### 3.3 PROTECTION

- A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.
1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
  2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

### 3.4 CLEANING

- A. Upon completion of installation of system, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish, including chips, scratches and abrasions.

### 3.5 MARKING AND IDENTIFICATION

- A. Mark and identify conduits in accordance with Section 26 0553 "Identification for Electrical Systems."

### 3.6 RECORD DOCUMENTS

- A. Accurately record actual routing of all feeder and sub-feeder conduits regardless of size and branch circuits conduits larger than 2-inches.

END OF SECTION 26 0533

**SECTION 26 0534  
BOXES, CABINETS AND ENCLOSURES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes boxes, cabinets, and enclosures for electrical wiring.

**1.3 SUBMITTALS**

- A. Submittals for approval by the Engineer are not required for this section. Unrequested submittals will not be processed or reviewed. Non-requirement of submittals is not to be construed as an allowance for substitutions and does not allow relief from full compliance with the contract documents.

**1.4 QUALITY ASSURANCE**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction and marked for intended use.
- B. Comply with the following standards:
  - 1. NECA "Standard of Installation."
  - 2. NEMA OS 1: Sheet-Steel Outlet Boxes, Device Boxes, Covers and Box Supports.
  - 3. NEMA OS 2: Non-Metallic Outlet Boxes, Device Boxes, Covers and Box Supports.
  - 4. NEMA FB 1: Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing and Cable.
  - 5. NEMA 250: Enclosures for Electrical Equipment (1000 Volts Maximum).

**PART 2 - PRODUCTS**

**2.1 OUTLET BOXES**

- A. General: Outlet boxes shall be constructed in accordance with National Electrical Code Article 314. Outlet boxes shall be sized for the volume required by the National Electrical Code, but in no case shall they be less than 1-1/2 inches deep.
- B. Sheet Metal Boxes: Comply with NEMA OS 1, galvanized steel.
- C. Cast Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy or aluminum, type FD with gasketed cover and threaded hubs.
- D. Boxes for switches or local light control shall be 4 inches square by 1-1/2 inches deep and shall be provided with raised cover to fit flush with finished wall line. Provide single

box for multiple-ganged devices with single coverplate, sized for the quantity of devices to be installed.

- E. Provide corrosion-resistant steel knockout closures for unused openings.

## **2.2 JUNCTION AND PULL BOXES**

- A. Stainless Steel Pull and Junction Boxes: Stainless steel NEMA 4X with gasketed cover.
- B. Covers: Covers shall be the same material as the box. Covers shall be on the largest access side of the box, unless otherwise indicated.
  - 1. Less than 12 inches in any dimension: Screw-on cover.
  - 2. Greater than 12 inches in any dimension: Hinged cover.

## **PART 3 - EXECUTION**

### **3.1 BOX AND CABINET INSTALLATION**

- A. General Installation Requirements:
  - 1. Electrical boxes are shown on drawings in approximate locations unless dimensioned. The Engineer shall be allowed to adjust the location of boxes up to 10 feet in any direction without additional cost to the project. This is intended for boxes for receptacles and switches and other wiring devices.
  - 2. Support all boxes, cabinets and enclosures rigidly and independently of conduit except where specifically allowed by the National Electrical Code. Use supports suitable for the purpose.
  - 3. Boxes located outdoors above ground shall be raintight and gasketed cast aluminum.
  - 4. Provide covers for all boxes.

### **3.2 PROTECTION**

- A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

### **3.3 CLEANING**

- A. Upon completion of installation of system, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish, including chips, scratches, and abrasions.

### **3.4 MARKING AND IDENTIFICATION**

- A. Mark and identify boxes, cabinets and enclosures in accordance with Section 260553 "Identification for Electrical Systems."

END OF SECTION 26 0534

**SECTION 26 0543**  
**UNDERGROUND DUCTS, RACEWAYS AND UTILITY STRUCTURES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes:
  - 1. Conduit, ducts, and duct accessories for direct-buried and concrete-encased duct banks
  - 2. Handholes.

**1.3 DEFINITION**

- A. RNC: Rigid nonmetallic conduit.
- B. RMC: Rigid metallic conduit

**1.4 SUBMITTALS**

- A. Product Data: For the following:
  - 1. Conduits and their accessories.
  - 2. Warning tape.
- B. Record Documents: Show dimensioned locations of underground ducts and handholes.

**1.5 QUALITY ASSURANCE**

- A. Comply with NFPA 70 "National Electrical Code" and ANSI C2 "National Electrical Safety Code" for components and installation.
- B. Coordinate elevations of duct and duct bank entrances into manholes and handholes with final

**1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Store all underground utility structures at Project site as recommended by manufacturer to prevent physical damage. Arrange so identification markings are visible.

**PART 2 - PRODUCTS**

**2.1 NONMETALLIC DUCTS AND DUCT ACCESSORIES**

- A. Conduit and Duct:
  - 1. NEMA TC 2 - Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80).

- 2. PVC Conduit and Tubing Fittings: NEMA TC 3.
- B. Manufactured Bends: Not less than 36-inch radius.

## **2.2 PRECAST CONCRETE HANDHOLES**

- 1. Refer to drawings for specifications and details.

## **2.3 SOURCE QUALITY CONTROL**

- A. Test and inspect precast concrete utility structures according to ASTM C 1037.

## **PART 3 - EXECUTION**

### **3.1 CORROSION PROTECTION**

- A. Aluminum shall not be installed in contact with earth or concrete.

### **3.2 UNDERGROUND DUCT APPLICATION**

- A. Ducts for Electrical Branch Circuits: RNC, NEMA TC 2 Schedule 40-PVC, in direct-buried trench or directional bored.

### **3.3 UNDERGROUND ENCLOSURE APPLICATION**

- A. Handholes and Pull Boxes for 600 V and Less:
  - 1. Refer to drawings for specifications and details.

### **3.4 EXAMINATION**

- A. Examine site to receive ducts and manholes for compliance with installation tolerances and other conditions affecting performance of the underground ducts and manholes. Do not proceed with installation until unsatisfactory conditions have been corrected.

### **3.5 EARTHWORK**

- A. Excavation and Backfill: Comply with Division 31 Section "Earth Moving," but do not use heavy-duty, hydraulic-operated compaction equipment.
- B. Restore surface features at areas disturbed by excavation and reestablish original grades unless otherwise indicated. Replace removed sod immediately after backfilling is completed.
- C. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary topsoil, fertilizer, lime, seed, sod, sprig and mulch. Comply with Division 32 Sections "Turf and Grasses" and "Plants."
- D. Cut and patch existing pavement in the path of underground ducts and utility structures according to Division 02 Section "Cutting and Patching."



### 3.6 INSTALLATION OF HANDHOLES

#### A. Precast Concrete Handhole Installation:

1. Comply with ASTM C 891 unless otherwise indicated.
2. Install units level and plumb and with orientation and depth coordinated with connecting ducts to minimize bends and deflections required for proper entrances.
3. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.

#### B. Elevations:

1. Install handholes with bottom below the frost line unless otherwise noted.
2. Handhole Covers: In paved areas and trafficways, set surface flush with finished grade. Set covers of other handholes 1 inch above finished grade.
3. Where indicated, cast handhole cover frame integrally with handhole structure.

END OF SECTION 26 0543

**SECTION 26 0553  
IDENTIFICATION FOR ELECTRICAL SYSTEMS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes:
1. Identification for underground systems.
  2. Identification for wires, cables, and conductors.
  3. Identification for electrical equipment.
  4. Miscellaneous identification products.

**1.3 SUBMITTALS**

- A. Submittals for approval by the Engineer are not required for this section. Unrequested submittals will not be processed or reviewed. Non-requirement of submittals is not to be construed as an allowance for substitutions and does not allow relief from full compliance with the contract documents.

**1.4 QUALITY ASSURANCE**

- A. Comply with the following standards:
1. ANSI A13.1 and IEEE C2.
  2. NFPA 70.
  3. 29 CFR 1910.144 and 29 CFR 1910.145.
  4. ANSI Z535.4 for safety signs and labels.
- B. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

**1.5 COORDINATION**

- A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

**PART 2 - PRODUCTS**

**2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
1. Electromark - Wolcott, New York.

2. Ideal Industries, Inc.
3. 3M.
4. Panduit Corp.
5. Seton Name Plate Co.
6. Thomas & Betts.
7. W. H. Brady, Co. - Signmark Division - Milwaukee, Wisconsin.

## 2.2 ELECTRICAL IDENTIFICATION PRODUCTS

- A. Self-Adhesive Vinyl Labels (Raceways and Boxes): Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- B. Self-Adhesive Vinyl Tape for Banding (Raceway, Wire and Cable): Colored, heavy duty, waterproof, fade resistant; 2 inches wide.
- C. Self-Adhesive Tape Markers (Wire and Cable): Vinyl or vinyl-cloth, self-adhesive, wraparound, cable and conductor markers with preprinted numbers and letters.
- D. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch (50 by 50 by 1.3 mm), with stamped legend, punched for use with self-locking cable tie fastener.
- E. Write-On Tags: Polyester tag, 0.015 inch (0.38 mm) thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
  1. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.
- F. Snap-Around, Color-Coding Bands (Raceways and Cables): Slit, pre-tensioned, flexible, solid-colored acrylic sleeve, 2 inches (50 mm) long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- G. Colored Adhesive Marking Tape (Raceways, Wires, and Cables): Self-adhesive plastic coated cloth tape similar to Brady 441XX or 442XX series.
- H. Conductor Identification Products:
  1. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide.
  2. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
- I. Underground Line Warning Tape:
  1. Underground Line Marking Tape: Permanent, bright-colored, corrosion-resistant, continuous-printed, plastic tape compounded for direct-burial service not less than 6 inches wide by 4 mils thick. Printed legend shall be indicative of general type of underground line below. Tape shall be 100% plastic to allow locating buried tape with electronic detection equipment. Provide marking tape similar to Thomas & Betts NAF series.

## 2.3 EQUIPMENT IDENTIFICATION LABELS

- A. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Overlay shall provide a weatherproof and UV-resistant

seal for label. Labels shall be at least 2-1/4 inches high. Where space does not permit this label size, smaller stock and lettering is permitted.

- B. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with lettering and background colors as indicated. Labels shall be at least 2-1/4 inches high. Where space does not permit this label size, smaller stock and lettering is permitted.
- C. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Labels shall be at least 2-1/4 inches high. Where space does not permit this label size, smaller stock and lettering is permitted.

## **2.4 CABLE TIES**

- A. Cable Ties: Fungus-inert, self-extinguishing, nylon one-piece, self-locking cable ties, 0.18-inch minimum width, 50-lb minimum tensile strength, and suitable for a minimum temperature range from minus 50 degrees F to 350 degrees F. Provide ties in specified colors when used for color-coding.
- B. Identification Cable Ties: Same as "Cable Ties" above, except with integral tab of suitable size for marking requirements.

## **2.5 MISCELLANEOUS IDENTIFICATION PRODUCTS**

- A. Paint: Comply with requirements in Division 09 painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior). Comply with maximum volatile organic compound levels imposed within Division 09.
- B. Fasteners for Labels and Signs: Self-tapping, stainless steel screws or stainless steel machine screws with nuts and flat and lock washers.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Verify identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Increase size of labels and letters to those appropriate for viewing from the floor for elevated components.
- C. Lettering and Graphics: Coordinate names, abbreviations, colors and other designations used in electrical identification work with corresponding designations specified or indicated. Install numbers, lettering and colors as required by code.
- D. Install identification devices in accordance with manufacturer's written instructions and requirements of NEC.
- E. Clean and degrease surfaces prior to applying identification products. Apply identification to surfaces that require finish after finish work is completed. Utilize primer for metal surfaces, heavy-duty acrylic resin block filler for concrete masonry, and clear alkali-resistant alkyd binder-type sealer for concrete surfaces.

- F. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- G. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25-foot (7.6-m) maximum intervals in congested areas.
- H. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.
- I. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:
  - 1. Outdoors: UV-stabilized nylon.
- J. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6 to 8 inches (150 to 200 mm) below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches (400 mm) overall.

### 3.2 LABEL COLOR CODE LEGEND

- A. Provide the following color coding scheme for each label based on the power system it is identifying:
  - 1. Normal Power: Black letters on white background.

### 3.3 RACEWAY IDENTIFICATION

- A. Identify Raceways of Certain Systems with Color Banding: Band exposed and accessible raceways of the following systems for identification. Bands shall be pre-tensioned, snap-around colored plastic sleeves, colored adhesive marking tape, or a combination of the two. Make each color band 2 inches wide, completely encircling conduit and place adjacent bands of two-color markings in contact, side by side. Install bands at changes in direction, at penetrations of walls and floors and at 20-foot maximum intervals in straight runs. Apply the following colors:
  - 1. Normal Distribution System (240/120V): White.
    - 2. Ground: Green.
    - 3. At contractor option, manufacturer painted EMT conduit (when EMT conduit is allowed or required to be used for the above systems), may be utilized in lieu of the banding noted above. Fittings would not have to be painted. All painting shall comply with Division 09 requirements.
- B. Where conduits leave a switchboard, panelboard, motor control center, etc., identification shall be provided on each conduit indicating the load being served.
- C. Contractor shall be responsible for providing the Owner with laminated, colored, typewritten legends indicating the identification color scheme. At a minimum, these legends should be installed in the main electrical room and branch electrical closets. Provide two additional legends to the Owner to use at their discretion.
- D. Identification of Raceways with Labeling:

1. Raceway Labeling: Provide labeling on conduits indicating electrical distribution system contained within (e.g. Normal, Life Safety, etc.) and operating voltage level. Label size shall be as follows:

Nominal EMT conduit size	Nominal RGS conduit size	Length of color background on label	Height of letters
up to 1 inch	up to 3/4 inch	8 inches	1/2 inch
1.25 to 1.5 inches	1 to 1.5 inches	8 inches	3/4 inch

### 3.4 CIRCUIT IDENTIFICATION

- A. Label conductors as follows:

1. Multiple Power or Lighting Circuits in the Same Enclosure: Where multiple branch circuits are terminated or spliced in a box or enclosure, label each conductor with source and circuit number.

### 3.5 CONDUCTOR COLOR CODING

- A. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, panelboards, manholes, handholes, switches, etc., use color-coding insulation for conductors.

- a. Colors for 240/120V Circuits:

- 1) Phase A: Black.
- 2) Phase B: Red.
- 3) Neutral: White.
- 4) Ground Bond: Green.

### 3.6 ELECTRICAL EQUIPMENT IDENTIFICATION

- A. On each unit of equipment, install unique designation label that is consistent with wiring diagrams, one-line diagram, schedules and the Operation and Maintenance Manual. Each section of a multiple-section equipment lineup shall be provided with its own identification label. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets and racks of each system. Systems include power, lighting, control, communication, signal, monitoring and alarm systems unless equipment is provided with its own identification.

- B. Labeling Instructions:

1. Outdoor Equipment: Provide engraved, laminated acrylic or melamine label.
2. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.
3. Nameplate Data: Provide permanent operational data nameplate on each item of power operated equipment, indicating manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances and similar essential data. Locate nameplates in an accessible location.

END OF SECTION 26 0553

**SECTION 26 0600  
ELECTRICAL DEMOLITION**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes:
  - 1. Electrical coordination, materials and methods for electrical demolition associated with building removal.

**1.3 SELECTIVE DEMOLITION**

- A. This Section includes limited scope general construction materials and methods for application with electrical installations as follows:
- B. Selective demolition including:
  - 1. Nondestructive removal of materials and equipment for reuse or salvage as indicated.
  - 2. Dismantling electrical materials and equipment made obsolete by these installations.
  - 3. Miscellaneous metals for support of electrical materials and equipment required to remain.

**1.4 PROJECT CONDITIONS**

- A. Conditions Affecting Selective Demolition: The following project conditions apply:
  - 1. Locate, identify and protect electrical services passing through demolition area and serving other areas outside the demolition limits. Maintain services to areas outside demolition limits. When services must be interrupted, install temporary services for affected areas.
  - 2. Maintain and protect existing building services that transit the area affected by selective demolition.

**1.5 SEQUENCE AND SCHEDULING**

- A. Coordinate the shut-off and disconnection of electrical services with the Owner and local utility, Columbia Water and Light. Coordinate any electrical outages required for service switchovers or connections with the Owner a minimum of five working days prior to the interruption. Comply with Owner's specific requirements for partial or complete outage requests.
- B. Assume that all required re-connection of existing systems or equipment not indicated for demolition must remain operational unless otherwise noted. Provide temporary connections to maintain electrical services and systems serving adjacent areas during required outages.

- C. Maintain existing electrical service and electrical distribution equipment in operation until the new electrical service or distribution equipment is energized, tested and accepted.

## **1.6 DRAWINGS AND SPECIFICATIONS**

- A. The civil, architectural, and electrical drawings and specifications shall be considered as mutually explanatory and complementary. Any electrical demolition work called for by one and not by the other shall be performed as though required by all. All sections and subsections of the Electrical work shall be governed by and subject to the general and supplementary conditions. Any discrepancies in or between the drawings and specifications, or between the drawings and actual field conditions shall be reported to the Engineer/Architect in sufficient time to issue an addendum for clarification.
- B. The electrical drawings are diagrammatic and the drawings indicate the general layout of the electrical systems. Field verification of scale dimensions on plans is directed since actual locations, distance and levels will be governed by actual field conditions.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS AND METHODS**

- A. Materials and methods required for removing, patching, connections, etc., shall be as specified in the associated specification sections.

## **PART 3 - EXECUTION**

### **3.1 COMMON REQUIREMENTS FOR ELECTRICAL DEMOLITION**

- A. Comply with NECA 1.

### **3.2 EXAMINATION AND COORDINATION**

- A. Examine substrates, areas and conditions with Installer present for compliance with requirements for conditions affecting demolition.
- B. Coordinate the demolition scope of work with the Owner and other Contractors to confirm that all required electrical demolition is addressed and scheduled to avoid disputes.

### **3.3 SELECTIVE DEMOLITION**

- A. The intention of the electrical demolition drawings is to disconnect and remove all electrical work made void by the scope of the construction and alteration.
- B. All existing electrical work and associated raceway and wiring, which has been made obsolete by the work and/or is shown dashed on the electrical demolition drawings shall be disconnected and removed back to the source of power unless otherwise noted. Although an attempt has been made to indicate all of this work, total accuracy is not guaranteed. Contractor shall visibly examine all areas and walls and ceilings scheduled for removal to determine existing electrical items to remain.
- C. All removed materials, other than removed materials to be relocated, or stored or turned over to the Owner shall become the property of the Contractor and shall be removed from the project site.
- D. Acceptance of contract means installer accepts existing conditions.



- E. Provide manifests and travel and disposal forms and documents to Owner when required by Owner or regulatory agencies.

END OF SECTION 26 0600

**SECTION 26 0923  
LIGHTING CONTROL DEVICES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes:
1. Exterior photocells.
  2. Lighting contactors.

**1.3 SUBMITTALS**

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

**1.4 QUALITY ASSURANCE**

- A. Products supplied shall be from a single manufacturer that has been continuously involved in manufacturing of lighting controls for a minimum of five (5) years. Mixing of manufacturers shall not be allowed.
- B. All components shall be U.L. listed, offer a five (5) year warranty and meet all state and local applicable code requirements.
- C. All occupancy sensors shall be tested to NEMA WD 7-2011 Occupancy Motion Sensors Standard.

**PART 2 - PRODUCTS**

**2.1 EXTERIOR PHOTOCELLS**

- A. Basis-of-Design Product: Subject to compliance with requirements, provide or comparable product by one of the following:
1. Cooper Industries, Inc
  2. Hubbell Building Automation
  3. Intermatic, Inc.
- B. Description: Solid state, with SPST or DPST dry contacts rated for 1800 VA, to operate connected load, complying with UL 773.
1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
  2. Light-Level Monitoring Range: 1.5 to 10 fc (16.14 to 108 lux), with an adjustment for turn-on and turn-off levels within that range.
  3. Time Delay: Thirty-second minimum, to prevent false operation.
  4. Lightning Arrester: Air-gap type.

5. Mounting: Twist lock complying with NEMA C136.10, with base.

## **PART 3 - EXECUTION**

### **3.1 WIRING INSTALLATION**

- A. Wiring within Enclosures: Comply with NECA 1. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.
- B. Size conductors according to lighting control device manufacturer's written instructions unless otherwise indicated.
- C. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

### **3.2 IDENTIFICATION**

- A. Identify components and power and control wiring according to Section 26 0553 "Identification for Electrical Systems."
  1. Identify controlled circuits in lighting contactors.
  2. Identify circuits or luminaires controlled by photoelectric sensors at each sensor.
- B. Label time switches and contactors with a unique designation.

### **3.3 FIELD QUALITY CONTROL**

- A. Perform the following tests and inspections:
  1. Operational Test: After installing sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.
  2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- B. Lighting control devices will be considered defective if they do not pass tests and inspections.

END OF SECTION 26 0923

**SECTION 26 2416  
PANELBOARDS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes:
  - 1. Lighting and appliance branch-circuit panelboards.

**1.3 SUBMITTALS**

- A. Product Data: For each type of panelboard, switching and overcurrent protective device, transient voltage suppression device, accessory and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings and finishes.
- B. Shop Drawings: For each panelboard and related equipment.
  - 1. Include dimensioned plans, elevations, sections and details. Show tabulations of installed devices, equipment features and ratings such as voltage, main bus ampacity, integrated short circuit ampere rating, overcurrent protective device arrangement and sizes.

**1.4 QUALITY ASSURANCE**

- A. Source Limitations: Obtain panelboards, overcurrent protective devices, components and accessories from single source from single manufacturer.
- B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for panelboards including clearances between panelboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70 by a qualified testing agency and marked for intended location and application.
- D. Comply with NEMA PB 1 "Panelboards."
- E. Comply with NFPA 70 "National Electrical Code."

**1.5 WARRANTY**

- A. Warranty: Panelboard and components shall be warranted to be free from manufacturing defects for a period of one year after project acceptance by Owner.

**1.6 EXTRA MATERIALS**

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Keys: Two spares for each type of panelboard cabinet lock.

**PART 2 - PRODUCTS**

**2.1 GENERAL REQUIREMENTS FOR PANELBOARDS**

- A. Fabricate and test panelboards according to IEEE 344 to withstand seismic forces defined in Division 20 Section "Seismic Protection."
- B. Enclosures: NEMA PB 1, Type 1, flush or surface mounted as shown on drawings.
  1. Rated for environmental conditions at installed location, unless otherwise noted on drawings, the following types shall be used in the listed locations:

Location	NEMA Type
Outdoor or Damp or wet interior locations	NEMA 3R

2. Finishes:
    - a. Panels and Trim: Steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
    - b. Back Boxes: Same finish as panels and trim.
  3. Directory Card: Inside panelboard door, mounted in transparent card holder.
- C. Phase, Neutral, and Ground Buses:
1. Material: Copper
  2. Main bussing shall be fully rated, non-tapered, ready to receive those overcurrent devices indicated as spaces without modifying the bus. Neutral bus to be rated at 100 percent of the main bus rating, capable of accepting terminations based on the maximum number of branch circuit protective devices allowed in the panelboard plus 6 additional conductors.
  3. Equipment Ground Bus: Adequate for panelboard feeder and branch-circuit equipment ground conductors. Equipment ground bus shall be large enough and have sufficient quantity and sizes of terminations to allow for termination of panelboard feeder plus one equipment-grounding conductor per circuit, based on the maximum number of branch circuit protective devices allowed in the panelboard plus 6 additional conductors. Increase terminations to accommodate additional feeder conductors where double-lugged panelboards are indicated. When panelboards are multiple sections, provide equipment ground busses in each section of sufficient size for all grounding conductors in that section. Ground busses to be insulated from the panelboard enclosure where isolated ground busses are called for. Ground busses shall be bonded to enclosure when isolated ground busses are not called for.
- D. Conductor Connectors: Suitable for use with conductor material and sizes.
1. Main, Neutral, and Ground Lugs and Buses: Provide mechanical connectors for conductors. Provide necessary additional wire bending and terminating space when sub-feed and feed-through lugs are called for.

- E. Service Equipment Label: NRTL labeled for use as service equipment for panelboards or load centers with one or more main service disconnecting and overcurrent protective devices.
- F. Future Devices: Mounting brackets, bus connections, filler plates and necessary appurtenances required for future installation of devices.
- G. Overcurrent Protection Devices: Multiple pole overcurrent protection devices shall be provided with a common trip handle for all poles. Tandem circuit breakers are not allowed.
- H. Panelboard Short-Circuit Current Rating: All distribution and branch circuit panelboards shall be fully rated to interrupt symmetrical short circuit current available at terminals. Series rated equipment is not allowed.

## 2.2 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
  - 2. ABB
  - 3. Siemens Energy & Automation, Inc.
  - 4. Square D; a brand of Schneider Electric.
- B. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.
- C. Doors: Hinged front cover, entire front trim hinged to box and with standard door within concealed hinged trim cover (door-in-door). Provide flush locks, keyed alike.
- D. Interiors: Provide physical means to prevent installation of more overcurrent protection devices than the quantity for which the enclosure was listed. Interiors shall be field convertible for top or bottom feed.
- E. Box: Box shall be nominally 5-3/4 inches deep by 20 inches wide.
- F. Circuit Numbering: Provide factory fabricated circuit numbers adjacent to each circuit breaker pole position. Numbering shall be continuous from topmost pole position to last possible pole position. Number sequence on left shall be 1-3-5-7, etc., and number sequence on right shall be 2-4-6-8, etc. Numbering material shall be insertable or strip type, as manufactured by the panelboard manufacturer for the specific panelboard. Adhesive markers and pen type markers are not acceptable.
- G. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity to meet available fault currents.
  - 1. Circuit Breakers: Provide molded-case, thermal-magnetic, trip-free, bolt-on circuit breakers (unless otherwise noted) replaceable without disturbing adjacent units. Circuit breaker escutcheon shall have ON and OFF markings. Circuit breaker handle accessories shall provide provisions for locking handle in the "ON" or "OFF" position. Circuit breaker faceplate and handle shall indicate rated ampacity. Circuit breaker faceplate shall indicate UL certification standards with applicable voltage systems and corresponding AIC ratings. Circuit breakers 30 amperes and less shall be UL listed to accept copper conductors with insulation rated at 60, 75 and 90 degrees Celsius, with conductors sized from the 60

degree Celsius column of Table 310.15(B)(16) of the NEC. Circuit breakers larger than 30 amperes shall be UL listed to accept copper conductors with insulation rated at 75 or 90 degrees Celsius with conductors sized from the 75 degree Celsius column of Table 310.16 of the NEC.

- H. Short Circuit Rating: Provide short circuit rating for each panelboard as indicated on drawings. Ratings indicated are minimum values. Manufacturer shall provide the next larger rating if the value indicated is unavailable.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine panelboards before installation. Reject panelboards that are damaged or rusted or have been subjected to water saturation.
- B. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION**

- A. Install panelboards and accessories according to NEMA PB 1.1.
- B. Mounting height: Mount panelboards such that the center grip of any operating handle, when in its highest position, is not more than 79 inches above the floor. Align top edges of panelboard covers where multiple panelboards are installed in the same general area.
- C. Install overcurrent protective devices and controllers not already factory installed.
- D. Install filler plates in unused spaces.

### **3.3 IDENTIFICATION**

- A. Comply with requirements within Division 26 Section "Identification for Electrical Systems."
- B. Circuit Directory: Provide typed circuit directory reflective of final circuit changes. Identify all circuits including spares. Spaces shall be left blank. Circuit designations shall describe the load type and location. For example, "Lighting - North Corridor" or "Receptacles - Rooms A, B, C and X, Y, Z." Use Owner's room designations, not designations shown on the plans, if different. Type on cardboard stock installed behind clear acrylic holder enabling removal of the directory.

### **3.4 FIELD QUALITY CONTROL**

- A. Visual and Mechanical Inspection: Include the following inspections and related work:
  - 1. Inspect for defects and physical damage, labeling and nameplate compliance with requirements of up-to-date drawings and panelboard schedules.
  - 2. Exercise and perform operational tests of all mechanical components and other operable devices in accordance with manufacturer's instruction manual.
  - 3. Check panelboard mounting, area clearances, alignment and fit of components.

4. Check tightness of bolted electrical connections with calibrated torque wrench. Refer to manufacturer's instructions for proper torque values.

END OF SECTION 26 2416



## SECTION 311000

### SITE CLEARING

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

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

##### 1.2 SUMMARY

- A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above- and below-grade site improvements.
6. Disconnecting, capping or sealing, and removing site utilities.
7. Temporary erosion and sedimentation-control measures.

##### 1.3 DEFINITIONS

- A. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- B. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.
- C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, or gray than underlying subsoil; contains organics; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; and free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.
- D. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

##### 1.4 MATERIAL OWNERSHIP

- A. Except for materials indicated to be stockpiled or otherwise remain on Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

## 1.5 SUBMITTALS

- A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.
  - 1. Use sufficiently detailed photographs or videotape.
  - 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.
- B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

## 1.6 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
  - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
  - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. Utility Locator Service: Notify Missouri One Call for area where Project is located before site clearing.
- C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises as directed by Owner.
- D. Do not commence site clearing operations until temporary erosion- and sedimentation-control measures are in place.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Division 31 Section "Earth Moving."
  - 1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.

- B. Locate and clearly identify trees, shrubs, and other vegetation to remain as shown on the Plans. Contractor shall verify all Superintendents, Managers, Subcontractors, etc. are aware of and understand where vegetation is to be protected.
- C. Protect existing site improvements to remain from damage during construction.
  - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

### 3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to the Civil Construction Plans and requirements of authorities having jurisdiction.
- B. Verify that flows of untreated water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
- D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

### 3.3 TREE AND PLANT PROTECTION

- A. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Owner.

### 3.4 EXISTING UTILITIES

- A. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
  - 1. Notify Owner not less than 5 days in advance of proposed utility interruptions.
  - 2. Do not proceed with utility interruptions without Owner's written permission.
- B. Excavate for and remove underground utilities indicated to be removed.

### 3.5 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
  - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
  - 2. Remove all stumps by excavating to include removal of associated root system.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches (200 mm), and compact each layer to a density equal to adjacent original ground.

### 3.6 TOPSOIL STRIPPING

- A. See Landscape specifications for topsoil testing requirements.
- B. Remove sod and grass before stripping topsoil.
- C. Strip topsoil to a depth of 6 to 18 inches, as encountered onsite, in a manner to prevent intermingling with underlying subsoil or other waste materials.
  1. Remove subsoil and nonsoil materials from topsoil, including clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; trash, debris, weeds, roots, and other waste materials.
- D. Stockpile topsoil away from edge of excavations without intermixing with subsoil in onsite area shown on Civil Plans. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.
  1. Do not stockpile topsoil within protection zones.
  2. Stockpile surplus topsoil to allow for respreading deeper topsoil.

### 3.7 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
  1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
  2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

### 3.8 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

END OF SECTION 311000

## SECTION 312000

### EARTH MOVING

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

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

##### 1.2 SUMMARY

###### A. Section Includes:

1. Preparing subgrades for slabs-on-grade, walks, pavements, turf and grasses, and plants.
2. Excavating and backfilling for buildings and structures.
3. Drainage course for concrete slabs-on-grade.
4. Base course for concrete walks and pavements.
5. Subbase course for asphalt paving.
6. Excavating and backfilling trenches for utilities and pits for buried utility structures.

###### B. Related Sections:

1. Division 31 Section "Site Clearing" for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.

##### 1.3 DEFINITIONS

###### A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

###### B. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

###### C. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

###### D. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

###### E. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Owner. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Owner. Unauthorized excavation, as well as remedial work directed by Owner, shall be without additional compensation.

F. Fill: Soil materials used to raise existing grades.

G. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material 3/4 cu. yd. (0.57 cu. m) or more in volume.

H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

I. Subbase Course: Aggregate layer placed between the subgrade and hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete walk.

J. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

K. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

#### 1.4 SUBMITTALS

A. Product Data: For each type of the following manufactured products required:

1. Warning tapes.

B. Samples for Verification: For the following products, in sizes indicated below:

1. Warning Tape: 12 inches (300 mm) long; of each color.

C. Material Test Reports: For each on-site soil material proposed for fill and backfill as follows:

1. Classification according to ASTM D 2487.

2. Laboratory compaction curve according to ASTM D 698.

D. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

#### 1.5 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.

2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

- B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.
  - 1. Do not proceed with work on adjoining property until directed by Owner.
- C. Utility Locator Service: Notify "Missouri One Call" for area where Project is located before beginning earth moving operations.
- D. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures, specified in Division 31 Section "Site Clearing," and as indicted in the Civil Plans are in place.

## PART 2 - PRODUCTS

### 2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: Soil Classification Groups GW, GM, GC, SM, SW, SP, SC, and CL according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 8 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter. Soils that classify as CH should be analyzed and approved by a qualified geotechnical engineer prior to use.
- C. Unsatisfactory Soils: Soil Classification Groups OL, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
  - 1. Unsatisfactory soils also include satisfactory soils not maintained within -2 to +4 percent of optimum moisture content at time of compaction.
  - 2. Unsatisfactory soils also include frozen soil, organics, rubbish, large rocks, construction materials like bricks or large pieces of concrete, wood, or other deleterious material.
- D. Subbase Material: Subbase material shall meet the crushed stone base MoDOT requirements of Section 1007 of the current Missouri Standards for Highway Construction, Type 1.
- E. Engineered Fill: Soil or granular fill containing sufficient fines to establish a moisture density relationship.
- F. Bedding Course: Material that meets the current specifications of MoDOT Type 1 or 5 granular material, or approved equal.
- G. Drainage Course: Rock course meeting the gradation requirements for a #67 rock as defined by ASTM C33.

### 2.2 ACCESSORIES

- A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications. Conduit to remain empty for this Project.
4. Green: Sewer systems.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. All activities will be contained within construction boundaries indicated on site plan. Specified excavation requirements, precautions, and protective systems will be observed at all times.
- B. Movement of trucks and equipment on Owner's property will be in accordance with Owner's instructions.
- C. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.
- D. Protect and maintain erosion and sedimentation controls during earth moving operations.
- E. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials..

### 3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
  1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

### 3.3 EXPLOSIVES

- A. Explosives: Do not use explosives.

### 3.4 EXCAVATION, GENERAL

- A. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Owner. The Contract Sum will be adjusted for rock excavation according to changes in work.
  1. Earth excavation includes foundations, footings, concrete piers, excavating pavements and obstructions visible on surface; underground structures, utilities, and other items



indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.

- a. Ram hammering; or ripping of material not classified as rock excavation is earth excavation.
2. Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction without exceeding the following dimensions:
  - a. 6 inches (150 mm) beneath pipe in trenches, and the greater of 24 inches (600 mm) wider than pipe or 42 inches (1065 mm) wide.

### 3.5 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

### 3.6 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
  1. Beyond building perimeter, excavate trenches to allow installation of top of pipe with a minimum cover of 48 inches (30" minimum cover for gas line trench, see detail in civil construction plans).
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit unless otherwise indicated.
  1. Clearance: 6 inches (150 mm) each side of pipe or conduit.
- C. Trench Bottoms: Excavate trenches 4 inches (100 mm) deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe. Remove projecting stones and sharp objects along trench subgrade.
  1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

### 3.7 SUBGRADE INSPECTION

- A. Notify Owner when excavations have reached required subgrade.
- B. If Owner determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof-roll subgrade below the building slabs and pavements with a pneumatic-tired and loaded 10-wheel, tandem-axle dump truck weighing not less than 20 tons to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
  1. Completely proof-roll subgrade in one direction. Limit vehicle speed to 3 mph (5 km/h).

2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Owner, and replace with compacted backfill or fill as directed.
3. All proof-rolls shall be observed by a representative of Engineering Surveys and Services and the Owner.

- D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
- E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Owner, without additional compensation.

### 3.8 NARROW DEEP EXCAVATIONS AND UNAUTHORIZED EXCAVATION

- A. Lean concrete fill, with 28-day compressive strength of 2500 psi (17.2 MPa), may be used when approved by Owner.
1. Fill unauthorized excavations under pipe, or conduit as directed by Owner.

### 3.9 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

### 3.10 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
  2. Surveying locations of underground utilities for Record Documents.
  3. Testing and inspecting underground utilities.
  4. Removing concrete formwork.
  5. Removing trash and debris.
  6. Removing temporary shoring and bracing, and sheeting.
  7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.

### 3.11 UTILITY TRENCH BACKFILL

- A. Trenches will not be backfilled until all required tests are completed and the utility systems, as installed, conform to requirements specified by the contract documents.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.
- C. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

- D. Trenches under Pavement: Place and compact backfill of Engineered Fill to the bottom of the pavement rock base and a minimum 1 foot beyond edge of pavement in all directions. Place and compact in 8" max lifts.
- E. Backfill voids with satisfactory soil while removing shoring and bracing.
- F. Trenches outside of pavement, buildings, or structural areas: Place and compact initial backfill of Bedding Course, to a height of 12 inches (300 mm) over the pipe or conduit.
  - 1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
  - 2. Backfill remaining trench of Satisfactory Soil material, free of particles larger than 1 inch (25 mm) in any dimension, in 8" maximum lifts to the bottom of top soil layer.
- G. Install warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

### 3.12 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place and compact fill material in layers to required elevations as follows:
  - 1. Under grass and planted areas, use satisfactory soil material.
  - 2. Under walks and pavements, use satisfactory soil material.
  - 3. Under steps and ramps, use satisfactory soil material.
  - 4. Under building slabs, use satisfactory soil material.
  - 5. Under footings and foundations, use satisfactory soil material.
- C. Place soil fill on subgrades free of mud, frost, snow, or ice.

### 3.13 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within -2 to +4 percent of optimum moisture content.
  - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
  - 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by +4 percent and is too wet to compact to specified dry unit weight.

### 3.14 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
  - 1. Under building slabs compact each layer of backfill or fill soil material at least 95 percent.
  - 2. Under walkways, structures, steps, and pavements, compact each layer of backfill or fill soil material at least 95 percent.
  - 3. Under turf or unpaved areas, compact each layer of backfill or fill soil material at least 95 percent to achieve bottom of topsoil layer elevation,
  - 4. For utility trenches, compact each layer to at least 95 percent.

### 3.15 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
  - 1. Provide a smooth transition between adjacent existing grades and new grades.
  - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
  - 1. Turf or Unpaved Areas: 6" below finish grade, plus or minus 1 inch (25 mm).
  - 2. Walks: Plus or minus 1/2 inch (13 mm).
  - 3. Pavements: Plus or minus 1/2 inch (13 mm).
- C. Owner will place topsoil. Contractor to grade finish grade 6 inches lower than finish grades shown on plans to within plus or minus 1" of finish grade in all disturbed green space areas.

### 3.16 SUBBASE COURSE UNDER PAVEMENTS AND WALKS

- A. Place subbase course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase course under pavements and walks as follows:
  - 1. Shape subbase course to required crown elevations and cross-slope grades.
  - 2. Place subbase course 6 inches (150 mm) or less in compacted thickness in a single layer.
  - 3. Place subbase course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
  - 4. Place and compact subbase course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

### 3.17 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

- A. Place drainage course on subgrades free of mud, frost, snow, or ice.
- B. On prepared structural fill, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:

1. Place drainage course 6 inches (150 mm) or less in compacted thickness in a single layer.
2. Place drainage course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
3. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 698.
4. Install vapor retarder on prepared drainage course according to manufacturer's written instructions, overlapping sides and ends.

### 3.18 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.
- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- C. Testing agency will test compaction of soils in place according to ASTM D 1556 and ASTM D 6938 as applicable. Tests will be performed at the following locations and frequencies:
  1. Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2,500 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.
  2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 150 feet (45 m) or less of wall length, but no fewer than two tests.
  3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet (46 m) or less of trench length, but no fewer than two tests.
  4. Paved areas, sidewalks, and other potential structural areas: At each compacted backfill layer, at least one test for every 10,000 square feet, but in no case fewer than 3 tests per lift.
- D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.
- E. Prior to the Contractor demobilizing from the site, the testing agency shall perform an as-built survey of all improvements constructed for the project to determine if they match the approved plans. Any and all deficiencies shall be corrected to match the plans by the Contractor with no additional compensation.

### 3.19 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
  1. Scarify or remove and replace soil material to depth as directed by Owner; reshape and recompact.

- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
  - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

### 3.20 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil, topsoil, and waste materials including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000

## SECTION 312333

### TRENCHING AND BACKFILLING

#### PART 1 -GENERAL

##### 1.1 SECTION INCLUDES

- A. This section encompasses the work required for excavation of trenches, structures, appurtenances, bedding, over-excavation of unsuitable material, and backfilling for the installation of utilities.
- B. Drawings and General Provisions of Contract, including General and Special Conditions, apply to this section.

##### 1.2 DEFINITIONS

- A. Maximum Density: Maximum dry weight in pounds per cubic foot of a specific material, as determined by ASTM D698, Standard Proctor Density
- B. Optimum Moisture: Percentage of water at maximum density
- C. Rock Excavation: Material that requires blasting or jack hammering for its practical and effective removal
  - 1. Materials include sandstone, limestone, flint, granite, quartzite, or similar material, in masses measuring more than one (1) cubic yard in volume or in ledges 4" or more in thickness.
  - 2. Rock encountered in two or more ledges, being 3" or thicker, with interlaying earth strata 12" thick, the entire volume from the top of the top ledge to the bottom of the bottom ledge will be classified as rock.
- D. Rubble: Buried concrete foundations, beams, walls, and other material which requires blasting or jack hammering for its practical and effective removal.
- E. Earth Excavation: Earth excavation will include all material not otherwise classified. Decomposed or disintegrated shale, which can be effectively plowed, spaded, or removed with power drive excavation equipment, and gravel base will be classified as earth excavation.
- F. Unstable Subgrade is subgrade softened, eroded by flooding or placement during unfavorable weather, or other Contractor controlled actions.
- G. Unsuitable Subgrade is natural material that cannot be compacted to the requirements of this section.
- H. Over excavation of Unsuitable Material: Removal of material that is too soft to provide adequate support as determined by the Owner's Representative for pipe being placed in the bottom of the trench.
- I. Granular Material Backfill and Bedding: Coarse sand, crushed rock or gravel, free from dust, clay, organic, and other undesirable materials.
- J. Payment Line: Used for over excavation of unsuitable material. The payment line shall be considered the lower of the bottom of the bedding material or a line 6" below and parallel to the pipe flow line. Width of over excavation shall be 2-feet

greater than the outside diameter of the pipe.

### 1.3 JOB CONDITIONS

A. Blasting: Blasting is not permitted on this project.

B. Length of open trench.

1. The maximum length of open trench shall be 200 feet.

2. The Contractor shall not leave an unattended open trench without fencing.

C. Protection of existing underground utilities.

1. The location of existing utilities shown on the drawings is based upon information and data supplied to the Owner or Engineer by the owner of the utility. The utilities are shown for information only. The information is not guaranteed to be either complete or accurate. It is the Contractor's responsibility to contact all utilities and obtain utility staking prior to construction.

2. Any damage to existing utilities shall be reported to the utility and repaired in accordance with the utility's standards.

3. The cost of repairs to damaged utilities shall be borne by the Contractor.

4. If utility service must be interrupted to complete a construction operation, the Contractor shall obtain permission from the Owner's Representative.

a. The Contractor shall notify the Owner's Representative at least 72 hours in advance of the time of the interruption and the expected duration of the interruption.

b. If the utility requires standby service, it shall be provided at the Contractor's expense.

5. If a non-scheduled interruption of utility service results from accidental damage, the Contractor shall take immediate steps as necessary to notify the Owner's Representative and restore service. The Contractor's personnel shall not leave the site until the interruption has been restored.

D. Scheduling

1. Clean up shall be performed promptly following utility installation backfill.

2. Repair of trench settlement shall be performed

promptly.

E. Erosion Control

1. The Contractor shall comply with the Drawings, Specifications, and all applicable Federal, State, or Local erosion control regulations.

2. The Contractor shall perform regular maintenance of all erosion control devices until time of final acceptance.

F. Maintenance

1. The Contractor is responsible for repair of trench settlement up to the level of the adjacent' grade that occurs during construction, as well as the warranty



period. This shall include restoration of the finish surface as appropriate.

#### 1.4 SITE COMPACTION TESTING

- A. The Owner's Representative will perform testing of compacted fill materials.
- B. Notify the Owner's Representative when work or portions of work under this Section are completed.
- C. If, during progress of work, tests indicate that compacted materials do not meet specified requirements, remove defective work. Replace at no cost to Owner.
- D. Allow the Owner's Representative the opportunity to test compacted fills before proceeding with placement of surface materials.
- E. Absence of compaction testing shall not relieve the Contractor of his obligation to satisfy the compaction requirements of this section.

#### 1.5 PROTECTION

- A. Protect trees, shrubs and lawns, and other features remaining as part of final landscaping.
- B. Protect benchmarks and existing structures, roads, sidewalks, paving, and curbs against damage from equipment and vehicular or foot traffic.
- C. Protect excavations by shoring, bracing, sheet piling, underpinning, or other methods, as required to prevent cave-ins or loose dirt from falling into excavations.
- D. Underpin adjacent structure(s), which may be damaged by excavation work, including service lines and pipe chases.
- E. Notify the Owner's Representative of unexpected subsurface conditions and discontinue work in area until the Owner's Representative provides notification to resume work.
- F. Grade around excavations to prevent surface water runoff into excavated areas.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

##### A. Backfill

- 1. Suitable Excavated Material or Borrow shall be free of cinders, ashes, refuse, sod, vegetative, or organic matter, boulders, rocks, or pavement fragments. Material shall meet ASTM D2487, soil classification groups, GW, GP, SW, SP, SM, CL, or CH.
- 2. Do not use sand backfill.
- 3. Granular backfill: Crushed limestone or gravel with 100% passing a 1" sieve, 20-75% passing a No.4 sieve, 20-40% passing a No.8 sieve, and 6-16% passing a No. 200 sieve

B. Topsoil: Provided and installed by

Owner. C. Trench Stabilization

1. Trench stabilizing material shall consist of crushed rock or other approved material

with 100% passing the 3" sieve and 25-95% passing the 1"

sieve.

D. Concrete

1. Concrete shall be a commercial grade with a minimum 28-day compressive strength

of 4,000 psi.

E. Bedding

1. Graded, crushed stone with %" minus material.

## PART 3 - EXECUTION

### 3.1 GENERAL

A. Replace or reinstall obstructions removed to accommodate construction equipment or to facilitate excavation after construction.

B. Do not remove trees unless noted on the drawings. Exercise care in operating equipment beneath the drip line or adjacent to trees to prevent damage. If damage occurs, the Owner will evaluate, determine the extent, and repair the damage. The Contractor is responsible for all costs related to the damage.

C. Pile excavated material suitable for backfill in an orderly manner a sufficient distance from the edge of excavation to avoid rollbacks, slides, or cave-ins.

D. Excavate by open-cut method for utilities and structures except as noted on Drawings.

E. The Contractor shall be responsible for providing barricades and protection around excavation and work areas.

### 3.2 SAFETY

A. The means of the work and the safety of the Contractor's employees are solely the responsibility of the Contractor. The Contractor has a contractual obligation to comply with all applicable laws and regulations including those of OSHA. At no time will either the Owner or Owner's Representative take responsibility for either the means of the work or the safety of the Contractor's employees.

### 3.3 SHEETING, SHORING, AND BRACING

A. Construct sheeting, shoring, and bracing required to hold walls of excavation, provide a safe area for workmen, protect existing utilities and structures, and to permit construction in the dry.

- B. Sheeting may be wood or steel.
- C. Wood Sheeting Driven below Level of Utility: Leave in place to a level of 5' below finished grade.
- D. Pull steel sheeting.
- E. When using a moveable trench box, below the spring line of pipe, it shall be lifted prior to any forward movement to avoid pipe displacement.
- F. Sheeting, shoring, and bracing shall not be paid for separately, but is considered incidental to the project.
- G. Sheeting and shoring shall be in accordance with OSHA and other applicable governmental regulations. The Contractor shall be solely responsible for complying with the regulations.
- H. Provide the Owner's Representative with shop drawings of proposed sheeting or shoring, signed and sealed by a registered Professional Engineer, licensed to practice in the state that the project is in.

### 3.4 PREPARATION

- A. Clearing
- B. Remove vegetative material and obstructions as necessary for construction.
- C. The Contractor shall properly dispose of removed material off the project site.
- D. The greater of the existing topsoil layer or the top 6" of native material shall be removed and disposed of offsite.

### 3.5 PERFORMANCE

#### A. General

1. General: Surplus and rejected unsuitable excavated material becomes property of the Contractor for

#### disposal. B. Trench Excavation

1. Excavated material shall be stored in such a manner as to avoid property damage.  
Repair any damage at the Contractor's expense.
2. Excavate the base of the trench to provide a uniform and continuous bearing and support on solid and undisturbed material.
3. The minimum trench width shall be sufficient to allow space for jointing and bedding.  
The maximum allowable trench width at a point 12" above the top of the pipe (pipe envelope) shall be the outside diameter plus 24 inches.
4. If rubble or rock is encountered, the trench shall be excavated to provide clearance of at least 6" below and 12" on each side of the utility line and fittings.
5. Remove and repair Unstable Subgrade at the Contractor's expense.
6. Over excavation of Unsuitable Material: When the Contractor encounters

material that is not suitable for supporting the pipe line or structure being constructed, the Contractor shall notify the Owner's Representative to obtain written instructions on how to proceed. Material removed prior to authorization of the Owner's Representative will not be eligible for payment. The over excavation will be backfilled to the payment line with granular material.

#### C. Bedding

1. Provide pipe with compacted granular bedding having a minimum thickness of 4" or  
1/8th of the outside pipe diameter, whichever is

#### greater. D. Dewatering

1. Excavation, installation of bedding, pipes, structures, and backfilling shall be done in dry conditions. If the subgrade is saturated or standing water exists, the work area shall be dewatered prior to installation or backfilling operations.
2. The Contractor shall make provisions to handle water encountered during construction. The Contractor shall obtain approval from the Owner's Representative of the proposed method of dewatering.
3. The Contractor shall prevent surface water from flowing into the excavated area. Divert or pump stream flow past the area of construction. Remove water accumulating in the area of construction.
4. Do not pump water onto adjacent property without approval of the Owner's Representative and adjacent property owner.

#### E. Trench Backfill

1. Trenches shall be backfilled only after the locations of connections and appurtenances have been recorded by the Contractor on the drawing set. This information is to be submitted to the Owner's Representative with other construction record information.
2. Place backfill in lifts of 8" or less prior to compaction.
3. Carefully place backfill in the pipe envelope (top of bedding to a point 12" above the pipe). Material shall be of even consistency and free of clumps and boulders, finely divided. Compact material to 95% maximum Standard Proctor Density. Material within the pipe envelope shall be the same as specified for trench backfill, unless noted otherwise on the Drawings.
4. Place backfill simultaneously on both sides of pipe to prevent displacement.
5. Place backfill into the trench at an angle so that impact on installed pipe is minimized.
6. Install a 3' minimum cushion of backfill above pipe envelope before using heavy compacting equipment. If pipe is damaged, replace the section of damaged pipe and provide additional depth of cushion.

#### F. Backfill Above the Pipe Envelope

1. Under and within 5' of pavement and undercut structures or right of way, compact suitable excavated material to 95% of maximum Standard Proctor

Density. The Contractor may substitute granular backfill with no additional cost to the Owner.

2. Under landscaped and lawn areas, compact suitable excavated material to 95% of maximum Standard Proctor Density. The top 6" of the backfill shall be installed by the Owner.
3. Place sidewalk and pavement base and/or surface above compacted backfill as noted on the Plans.

### 3.6 FIELD QUALITY CONTROL

- A. The Contractor shall furnish and provide equipment and personnel to provide access for the Owner's Representative to any test location and test depth necessary, in the Owner's Representative's opinion, to properly evaluate compaction effort.
- B. If specified compaction rates are not attained, the Owner's Representative may require the Contractor to utilize different compaction methods or lift thickness.
- C. Compaction Testing
  1. The Owner's Representative will perform compaction testing, unless noted otherwise.
  2. The moisture density relation to be used in establishing compaction will be ASTM D698 (Standard Proctor) or ASTM D4253 (Relative Density).
  3. Compaction effort may be evaluated by the use of any of the following standard test methods:
    - a. ASTM D-1 556 (sand cone)
    - b. ASTM D-2922 (nuclear)
    - c. The Owner's Representative will determine the Compaction Testing Frequency.

END OF SECTION 312333

## SECTION 321216

### ASPHALT PAVING

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

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

##### 1.2 SUMMARY

###### A. Section Includes:

1. Hot-mix asphalt paving.
2. Asphalt surface treatments.
3. Pavement-marking paint.
4. Imprinted asphalt.

###### B. Related Sections:

1. Division 31 Section "Earth Moving" for aggregate subbase and base courses and for aggregate pavement shoulders.
2. Division 32 Section "Concrete Paving Joint Sealants" for joint sealants and fillers at paving terminations.

##### 1.3 DEFINITION

- A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

##### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.
  1. Job-Mix Designs: For each job mix proposed for the Work.
- B. Qualification Data: For qualified manufacturer and Installer.
- C. Material Certificates: For each paving material, from manufacturer.
- D. Material Test Reports: For each paving material.

##### 1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of the current MoDOT Standard Specifications for Highway Construction for asphalt paving work.

- B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.
- B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

## 1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
  - 1. Prime Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
  - 2. Tack Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
  - 3. Asphalt Base Course: Minimum surface temperature of 40 deg F (4.4 deg C) and rising at time of placement.
  - 4. Asphalt Surface Course: Minimum surface temperature of 60 deg F (15.6 deg C) at time of placement.
- B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 55 deg F (12.8 deg C), and not exceeding 95 deg F (35 deg C).

## PART 2 - PRODUCTS

### 2.1 AGGREGATES

- A. General: Use materials and gradations that have performed satisfactorily in previous installations.
- B. Asphalt aggregate: Per the current MoDOT Standard Specifications for Highway Construction for Type C surface course and MoDOT plant mix bituminous course.
- C. Type 1 Aggregate: Per the current MoDOT Standard Specifications for Highway Construction.

### 2.2 ASPHALT MATERIALS

- A. All asphalt material shall conform to the current MoDOT Standard Specifications for Highway Construction for Type C surface course and MoDOT plant mix bituminous course.
- B. Water: Potable.

## 2.3 AUXILIARY MATERIALS

- A. Sand: ASTM D 1073 or AASHTO M 29, Grade Nos. 2 or 3.
- B. Pavement-Marking Paint: Acrylic Waterborne Pavement Marking Paint per current MoDOT standards, lead and chromate free, ready mixed, complying with FS TT-P-1952, Type II, with drying time of less than 45 minutes.
  - 1. Color: As indicated in civil plans.

## 2.4 MIXES

- A. Hot-Mix Asphalt: Per the current MoDOT Standard Specifications for Highway Construction for Type C surface course and MoDOT plant mix bituminous course.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that subgrade is dry and in suitable condition to begin paving.
- B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
  - 1. Completely proof-roll subgrade in one direction. Limit vehicle speed to 3 mph (5 km/h).
  - 2. Proof roll with a pneumatic tired loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes).
  - 3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Owner, and replace with compacted backfill or fill as directed.
- C. Proceed with paving only after unsatisfactory conditions have been corrected.
- D. Verify that utilities, traffic loop detectors, and other items requiring a cut and installation beneath the asphalt surface have been completed and that asphalt surface has been repaired flush with adjacent asphalt prior to beginning installation of imprinted asphalt.

### 3.2 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
- B. Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.20 gal./sq. yd. Apply enough material to penetrate and seal but not flood surface. Allow prime coat to cure.
  - 1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
  - 2. Protect primed substrate from damage until ready to receive paving.



- C. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd. (0.2 to 0.7 L/sq. m).
  - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
  - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

### 3.3 HOT-MIX ASPHALT PLACING

- A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
  - 1. Place hot-mix asphalt base course per current MoDOT Standard Specifications for Highway Construction.
- B. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

### 3.4 JOINTS

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.
  - 1. Clean contact surfaces and apply tack coat to joints.
  - 2. Offset longitudinal joints, in successive courses, a minimum of 6 inches (150 mm).
  - 3. Offset transverse joints, in successive courses, a minimum of 24 inches (600 mm).
  - 4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method according to AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."
  - 5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
  - 6. Compact asphalt at joints to a density within 2 percent of specified course density.

### 3.5 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
  - 1. Complete compaction before mix temperature cools to 185 deg F (85 deg C).
- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

1. Minimum Asphaltic Course Density: At least 98 percent of reference laboratory density according to ASTM D 6927.
  2. Minimum Bituminous Course Density: At least 95 percent of reference lab density according to ASTM D 6927.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
- F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

### 3.6 INSTALLATION TOLERANCES

- A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
1. Base Course: Plus or minus 1/2 inch (13 mm).
  2. Surface Course: Plus 1/4 inch (6 mm), no minus.
- B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot (3-m) straightedge applied transversely or longitudinally to paved areas:
1. Base Course: 1/4 inch (6 mm).
  2. Surface Course: 1/8 inch (3 mm).
  3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch (6 mm).

### 3.7 PAVEMENT MARKING

- A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Owner.
- B. Allow paving to age for 30 days before starting pavement marking.
- C. Sweep and clean surface to eliminate loose material and dust.
- D. 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 (0.4 mm).

### 3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Field testing, frequency, and methods may vary as determined by and between the Owner and the Owner's Testing Agency.
- C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.
- D. Asphaltic surface and base courses shall be randomly cored at a minimum rate of 1 core per 20,000 square feet of paving, but not less than 3 cores in light duty areas and 3 cores in heavy-duty areas shall be obtained. Asphaltic concrete pavement samples shall be tested for conformance with mix design.
- E. Immediately replace and compact hot-mix asphalt where core tests were taken.
- F. Thickness Test: Measure thickness of each core sample taken. The thickness of the course or the combined courses shall meet or exceed the indicated thickness. Where the deficiency exists, remove the affected pavement area and replace it with new pavement or, at discretion of Owner, correct deficient paving thickness with tack coat and minimum 1-in overlay.
- G. Field density test for in-place materials:
  - 1. Density test shall be conducted on each core sample taken in accordance with ASTM D1188 or D2726 as applicable.
  - 2. In-place density tests by nuclear method in accordance with ASTM D2950 shall also be taken per 20,000 square feet of paving, but not less than 3 cores in light duty areas and 3 cores in heavy-duty areas, to assure the specified density is obtained. Nuclear density shall be correlated with ASTM D1188 or D2726.
- H. Check all pavement for ponding areas. Correct all ponding areas in a way acceptable to the Owner. All corrections shall be done at no cost to the Owner.
- I. Remove and replace unacceptable areas as directed by Owner.
- J. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

### 3.9 DISPOSAL

- A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.
  - 1. Do not allow milled materials to accumulate on-site.

END OF SECTION 321216

SECTION 32 1313

CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes concrete paving, including the following:

1. Driveways.
2. Roadways.
3. Parking lots.
4. Curbs and gutters.
5. Walks.

B. Related Requirements:

1. Section 321373 "Concrete Paving Joint Sealants" for joint sealants in expansion and contraction joints within concrete paving and in joints between concrete paving and asphalt paving or adjacent construction.

1.2 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash, slag cement, and other pozzolans.

B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to concrete paving, including but not limited to, the following:
  - a. Concrete mixture design.
  - b. Quality control of concrete materials and concrete paving construction practices.
2. Require representatives of each entity directly concerned with concrete paving to attend, including the following:
  - a. Contractor's superintendent.
  - b. Concrete paving Subcontractor.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

- B. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified ready-mix concrete manufacturer.
- B. Material Certificates: For the following, from manufacturer:
  - 1. Cementitious materials.
  - 2. Steel reinforcement and reinforcement accessories.
  - 3. Fiber reinforcement.
  - 4. Admixtures.
  - 5. Curing compounds.
  - 6. Applied finish materials.
  - 7. Bonding agent or epoxy adhesive.
  - 8. Joint fillers.
- C. Material Test Reports: For each of the following:
  - 1. Aggregates: Flint and chert will be limited to 1% maximum, by weight of the course aggregate, in all exposed concrete (cast-in-place or precast). Lignite will be limited to 0.07%, by weight of the fine aggregate in all exposed concrete.
- D. Field quality-control reports.

#### 1.6 QUALITY ASSURANCE

- A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

#### 1.7 FIELD CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.
- B. Cold-Weather Concrete Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:
  - 1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
  - 2. Do not use frozen materials or materials containing ice or snow.

3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.
- C. Hot-Weather Concrete Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:
1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
  2. Cover steel reinforcement with water-soaked burlap, so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
  3. Fog-spray forms and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

## PART 2 - PRODUCTS

### 2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with ACI 301 unless otherwise indicated.

### 2.2 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.
1. Use flexible or uniformly curved forms for curves with a radius of 100 feet or less.
- B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

### 2.3 STEEL REINFORCEMENT

- A. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, fabricated from as-drawn steel wire into flat sheets.
- B. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, flat sheet.
- C. Reinforcing Bars: ASTM A615/A615M, Grade 60; deformed.
- D. Steel Bar Mats: ASTM A184/A184M; with ASTM A615/A615M, Grade 60 deformed bars; assembled with clips.
- E. Plain-Steel Wire: ASTM A1064/A1064M, as drawn.
- F. Deformed-Steel Wire: ASTM A1064/A1064M.

- G. Joint Dowel Bars: ASTM A615/A615M, Grade 60 plain-steel bars. Cut bars true to length with ends square and free of burrs.
- H. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded-wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

## 2.4 CONCRETE MATERIALS

- A. Cementitious Materials: Use the following cementitious materials, of same type, brand, and source throughout Project:
  - 1. Portland Cement: ASTM C150/C150M, gray portland cement Type I/II [
  - 2. Fly Ash: ASTM C618, Class C.
- B. Normal-Weight Aggregates: ASTM C33/C33M, uniformly graded. Provide aggregates from a single source with documented service-record data of at least 10 years' satisfactory service in similar paving applications and service conditions using similar aggregates and cementitious materials.
  - 1. Maximum Coarse-Aggregate Size: 1 inch nominal.
  - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Water: Potable and complying with ASTM C94/C94M.

## 2.5 CURING MATERIALS

- A. Water: Potable.
- B. White pigmented, Waterborne, Membrane-Forming Curing Compound: ASTM C309, Type 1, Class B, dissipating.

## 2.6 RELATED MATERIALS

- A. Joint Fillers: ASTM D1751, asphalt-saturated cellulosic fiber in preformed strips.

## 2.7 CONCRETE MIXTURES

- A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.
  - 1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
  - 2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that comply with or exceed requirements.

- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
  - 1. Fly Ash or Pozzolan: 15 percent.
  
- C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:
  - 1. Air Content, 1-inch Nominal Maximum Aggregate Size: 6 percent minus 1 percent to plus 2 percent.
  - 2. Air Content, 3/4-inch Nominal Maximum Aggregate Size: 6 percent minus 1 percent to plus 2 percent.
  
- D. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.
  - 1. Use water-reducing admixture in concrete as required for placement and workability.
  - 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
  
- E. Concrete Mixtures: Normal-weight concrete.
  - 1. Compressive Strength (28 Days): 4000 psi.
  - 2. Maximum W/C Ratio at Point of Placement: 0.45
  - 3. Slump Limit: 4 inches plus or minus 1 inch.

## 2.8 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C94/C94M. Furnish batch certificates for each batch discharged and used in the Work.
  - 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.
  
- B. Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding.
  - 1. Completely proof-roll subbase in one direction. Limit vehicle speed to 3 mph.
  - 2. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than 15 tons.



3. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of 1 inch according to requirements in Section 312000 "Earth Moving."
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.

### 3.3 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

### 3.4 INSTALLATION OF STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.
- C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.
- D. Install welded-wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh. Offset laps of adjoining widths to prevent continuous laps in either direction.

### 3.5 JOINTS

- A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.
  1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.
- B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.
  2. Provide tie bars at sides of paving strips where indicated.
  3. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.
- C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.
1. Locate expansion joints at intervals of 50 feet unless otherwise indicated.
  2. Extend joint fillers full width and depth of joint.
  3. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
  4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
  5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
  6. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.
- D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:
1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.
    - a. Tolerance: Ensure that sawed joints are within 3 inches either way from centers of dowels.
  2. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.
- E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 3/8-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

### 3.6 CONCRETE PLACEMENT

- A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.

- B. Remove snow, ice, or frost from subbase surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.
- C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.
- E. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- F. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.
  - 1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels and joint devices.
- G. Screed paving surface with a straightedge and strike off.
- H. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleedwater appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.
- I. Curbs and Gutters: Use design mixture for automatic machine placement. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing.
- J. Slip-Form Paving: Use design mixture for automatic machine placement. Produce paving to required thickness, lines, grades, finish, and jointing.
  - 1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of slip-form paving machine during operations.

### 3.7 FLOAT FINISHING

- A. General: Do not add water to concrete surfaces during finishing operations.
- B. Float Finish: Begin the second floating operation when bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
  - 1. Burlap Finish: Drag a seamless strip of damp burlap across float-finished concrete, perpendicular to line of traffic, to provide a uniform, gritty texture.

2. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface, perpendicular to line of traffic, to provide a uniform, fine-line texture.
3. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.

### 3.8 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Comply with ACI 306.1 for cold-weather protection.
- C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.
- D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- E. Curing Methods: Cure concrete by curing compound as follows:
  1. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating, and repair damage during curing period.

### 3.9 PAVING TOLERANCES

- A. Comply with tolerances in ACI 117 and as follows:
  1. Elevation: 3/4 inch.
  2. Thickness: Plus 3/8-inch, minus 1/4 inch.
  3. Surface: Gap below 10-foot-long; unlevelled straightedge not to exceed 1/2 inch.
  4. Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: 1/2 inch per 12 inches of tie bar.
  5. Lateral Alignment and Spacing of Dowels: 1 inch.
  6. Vertical Alignment of Dowels: 1/4 inch.
  7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches of dowel.
  8. Joint Spacing: 3 inches.
  9. Contraction Joint Depth: Plus 1/4 inch, no minus.
  10. Joint Width: Plus 1/8 inch, no minus.

### 3.10 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Testing Services: Testing and inspecting of composite samples of fresh concrete obtained according to ASTM C172/C172M will be performed according to the following requirements:
  - 1. Testing Frequency: Obtain at least one composite sample for each 25 cu. yd. or fraction thereof of each concrete mixture placed each day and one test for each additional 50 cu. yd. placed.
  - 2. Slump: ASTM C143/C143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
  - 3. Air Content: ASTM C231/C231M, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
  - 4. Concrete Temperature: ASTM C1064/C1064M; one test hourly when air temperature is 40 deg F and below and when it is 80 deg F and above, and one test for each composite sample.
  - 5. Compression Test Specimens: ASTM C31/C31M; cast and laboratory cure one set of four standard cylinder specimens for each composite sample.
  - 6. Compressive-Strength Tests: ASTM C39/C39M; test one specimen at seven days and two specimens at 28 days.
    - a. A compressive-strength test to be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.
- C. Test data from concrete cylinder breaks will be evaluated using procedures of the American Concrete Institute (latest edition of ACI 214) to determine if the compressive strength of the concrete tested is acceptable.
- D. Test results to be reported in writing to Owner's Representative, Engineer, and Contractor within 48 hours of testing. Reports of compressive-strength tests to contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as sole basis for approval or rejection of concrete.
- F. Additional Tests: Testing and inspecting agency will make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer.
- G. Concrete paving will be considered defective if it does not pass tests and inspections.

- H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- I. Prepare test and inspection reports.

### 3.11 REPAIR AND PROTECTION

- A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Engineer.
- B. Drill test cores, where directed by Engineer, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.
- C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 321313

## SECTION 321373

### CONCRETE PAVING JOINT SEALANTS

#### SECTION 321373 - CONCRETE PAVING JOINT SEALANTS

##### PART 1 - GENERAL

##### 1.1 SUMMARY

###### A. Section Includes:

1. Cold-applied joint sealants.
2. Joint-sealant backer materials.

###### B. Related Requirements:

##### 1.2 PREINSTALLATION MEETINGS

- ###### A. Preinstallation Conference: Conduct conference at Project Site.

##### 1.3 ACTION SUBMITTALS

###### A. Product Data:

1. Concrete pavement joint sealants.
2. Joint-sealant backer materials.

- ###### B. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for each type of joint sealant.

###### C. Paving-Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

##### 1.4 QUALITY ASSURANCE

###### A. Qualifications:

1. Installers: Entity that employs installers and supervisors who are trained and approved by manufacturer.

## 1.5 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
  - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
  - 2. When joint substrates are wet.
  - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
  - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

## PART 2 - PRODUCTS

### 2.1 JOINT SEALANTS, GENERAL

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

### 2.2 COLD-APPLIED JOINT SEALANTS

- A. Single-Component, Nonsag, Silicone Joint Sealant: ASTM D5893/D5893M, Type NS.

### 2.3 JOINT-SEALANT BACKER MATERIALS

- A. Joint-Sealant Backer Materials: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by joint-sealant manufacturer, based on field experience and laboratory testing.
- B. Round Backer Rods for Cold- and Hot-Applied Joint Sealants: ASTM D5249, Type 1, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.
- C. Round Backer Rods for Cold-Applied Joint Sealants: ASTM D5249, Type 3, of diameter and density required to control joint-sealant depth and prevent bottom-side adhesion of sealant.
- D. Backer Strips for Cold- and Hot-Applied Joint Sealants: ASTM D5249; Type 2; of thickness and width required to control joint-sealant depth, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.



## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine joints to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning of Joints: Before installing joint sealants, clean out joints immediately to comply with joint-sealant manufacturer's written instructions.
  - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

### 3.3 INSTALLATION OF JOINT SEALANTS

- A. Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.
- B. Joint-Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions.
- C. Install joint-sealant backers to support joint sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  - 1. Do not leave gaps between ends of joint-sealant backer materials.
  - 2. Do not stretch, twist, puncture, or tear joint-sealant backer materials.
  - 3. Remove absorbent joint-sealant backer materials that have become wet before sealant application and replace them with dry materials.
- D. Install joint sealants immediately following backer material installation, using proven techniques that comply with the following:
  - 1. Place joint sealants so they fully contact joint substrates.
  - 2. Completely fill recesses in each joint configuration.
  - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Joint Sealants: Immediately after joint-sealant application and before skinning or curing begins, tool sealants in accordance with the following requirements to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint:

1. Remove excess joint sealant from surfaces adjacent to joints.
  2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.
- F. Provide joint configuration to comply with joint-sealant manufacturer's written instructions unless otherwise indicated.

### 3.4 CLEANING AND PROTECTION

- A. Clean off excess joint sealant as the Work progresses, by methods and with cleaning materials approved in writing by joint-sealant manufacturers.
- B. Protect joint sealants, during and after curing period, from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations in repaired areas are indistinguishable from the original work.

### 3.5 PAVING-JOINT-SEALANT SCHEDULE

- A. Joints within concrete paving:
1. Joint Location:
    - a. Expansion and isolation joints in concrete paving.
    - b. Contraction joints in concrete paving.
    - c. Other joints as indicated.
  2. Joint Sealant: Single-component, nonsag, silicone joint sealant.
  3. Joint-Sealant Color: concrete gray.

END OF SECTION 321373

## SECTION 33 1415

### SITE WATER DISTRIBUTION PIPING

#### PART 1 - GENERAL

##### 1.1 SUMMARY

###### A. Section Includes:

1. Water-distribution piping and related components outside the building. Terminate water-piping with appropriate caps or plugs.

###### B. Related Requirements:

1. Specifications For Water Main Construction, City of Columbia Water & Light Department, most recent edition.

##### 1.2 DEFINITIONS

- A. CDA: Copper Development Association.
- B. EPDM: Ethylene-propylene-diene terpolymer rubber.
- C. PA: Polyamide (nylon) plastic.
- D. PE: Polyethylene plastic.
- E. PP: Polypropylene plastic.

##### 1.3 ACTION SUBMITTALS

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

##### 1.4 INFORMATIONAL SUBMITTALS

- A. Field Quality-Control Submittals:
  1. Field quality-control reports.

##### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Preparation for Transport: Prepare piping, valves, meters, backflow prevention devices, and fire hydrants according to the following:
  1. Ensure that piping, valves, meters, backflow prevention devices, and fire hydrants are dry and internally protected against rust and corrosion.

## SECTION 33 1415

### SITE WATER DISTRIBUTION PIPING

2. Protect threaded ends and flange faces against damage.
  3. Set piping, valves, meters, backflow prevention devices, and fire hydrants in best position for handling and to prevent rattling.
- B. During Storage: Use precautions for piping, valves, meters, backflow prevention devices, and fire hydrants according to the following:
1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
  2. Protect from weather. Store indoors and maintain temperature higher than ambient dew point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.
- C. Handling: Use sling to handle products if size requires handling by crane or lift. Rig products to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.
- D. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- E. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.
- F. Protect flanges, fittings, and specialties from moisture and dirt.
- G. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

#### 1.6 PROJECT CONDITIONS

- A. Interruption of Existing Water-Distribution Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water-distribution service in accordance with requirements indicated:
1. Notify Owner no fewer than two weeks in advance of proposed interruption of service.
  2. Do not proceed with interruption of water-distribution service without Owner's written permission.

#### 1.7 COORDINATION

- A. Coordinate with Owner and utility company.

## SECTION 33 1415

### SITE WATER DISTRIBUTION PIPING

#### PART 2 - PRODUCTS

##### 2.1 PERFORMANCE REQUIREMENTS

- A. Comply with requirements of utility company supplying water. Include tapping of water mains and backflow prevention.
- B. Comply with standards of authorities having jurisdiction for domestic water-service piping, including materials, installation, testing, and disinfection.
- C. Comply with standards of authorities having jurisdiction for fire-suppression water-service piping, including materials, hose threads, installation, and testing.
- D. Piping materials to bear label, stamp, or other markings of specified testing agency.

##### 2.2 PIPING MATERIALS

- A. Comply with requirements in Specifications for Water Main Construction, City of Columbia Water & Light Department, most recent edition.
- B. DUCTILE-IRON PIPE AND FITTINGS
- C. Mechanical-Joint, Ductile-Iron Fittings:
  - 1. AWWA C110, ductile- or gray-iron standard pattern or AWWA C153/A21.53, ductile-iron compact pattern.
  - 2. Glands, Gaskets, and Bolts: AWWA C111/A21.11, ductile- or gray-iron glands, rubber gaskets, and steel bolts.
  - 3. AWWA C104/A21.4 cement mortar-lined.
- D. Push-on-Joint, Ductile-Iron Pipe:
  - 1. AWWA C151/A21.51, with push-on-joint bell and plain spigot end unless grooved or flanged ends are indicated.
  - 2. AWWA C104/A21.4 cement mortar-lined.

##### 2.3 PVC PIPE AND FITTINGS

- A. PVC Pipe: AWWA C900 with bell end with gasket, and with spigot end.

##### 2.4 PIPING JOINING MATERIALS

- A. Gaskets for Ferrous Piping and Copper-Alloy Tubing: ASME B16.21, asbestos free.

## SECTION 33 1415

### SITE WATER DISTRIBUTION PIPING

- B. Plastic Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.

#### 2.5 GATE VALVES

- A. Gate Valves - AWWA, Cast Iron:

1. From approved Columbia Water & Light manufacturers.
2. Gate Valves - Nonrising Stem, Resilient Seated: Cast- or ductile-iron body and bonnet, with bronze or cast- or ductile-iron gate, resilient seats, bronze stem, and stem nut.
  - a. Standards: AWWA C509 or AWWA C515.
  - b. Minimum Pressure Rating: 200 psig
  - c. End Connections: Mechanical joint.
  - d. Interior Coating: Complying with AWWA C550.

#### 2.6 INSTALLATION OF PIPING

- A. Water-Main Connection:

1. Arrange with utility company for tap of size and location.
2. Tap water main in accordance with requirements of water utility company and of size and in location indicated.
3. Install PE corrosion-protection encasement in accordance with ASTM A674 or AWWA C105/A21.5.
4. Install copper tube and fittings in accordance with CDA's "Copper Tube Handbook."

- B. Install ductile-iron, water-service piping in accordance with AWWA C600 and AWWA M41.

1. Install PE corrosion-protection encasement in accordance with ASTM A674 or AWWA C105/A21.5.

- C. Install PE pipe in accordance with ASTM D2774 and ASTM F645.

- D. Install PVC, AWWA pipe in accordance with ASTM F645 and AWWA M23.

- E. Bury piping with depth of cover over top at least 42 inches.

- F. Install piping by tunneling or jacking, or combination of both, under streets and other obstructions that cannot be disturbed.

## SECTION 33 1415

### SITE WATER DISTRIBUTION PIPING

- G. Install underground piping with restrained joints at horizontal and vertical changes in direction. Use restrained-joint piping, thrust blocks, anchors, tie-rods and clamps, and other supports.

#### 2.7 JOINT CONSTRUCTION

- A. Make pipe joints according to the following:
  - 1. Copper-Tubing, Pressure-Sealed Joints: Join copper tube and pressure-seal fittings with tools and procedures recommended by pressure-seal-fitting manufacturer. Leave insertion marks on pipe after assembly.
  - 2. Ductile-Iron Piping, Gasketed Joints for Water-Service Piping: AWWA C600 and AWWA M41.
  - 3. Ductile-Iron Piping, Gasketed Joints for Fire-Service-Main Piping: UL 194.
  - 4. PVC Piping Gasketed Joints: Use joining materials in accordance with AWWA C900. Construct joints with elastomeric seals and lubricant in accordance with ASTM D2774 or ASTM D3139 and pipe manufacturer's written instructions.

#### 2.8 INSTALLATION OF ANCHORAGE

- A. Anchorage: Install water-distribution piping with restrained joints. Anchorages and restrained-joint types that may be used include the following:
  - 1. Concrete thrust blocks.
  - 2. Locking mechanical joints.
- B. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches. Include anchorages for the following piping systems:
  - 1. Gasketed-Joint, Ductile-Iron, Water-Service Piping: In accordance with AWWA C600.
  - 2. Gasketed-Joint, PVC Water-Service Piping: In accordance with AWWA M23.
- C. Apply full coat of asphalt or other acceptable corrosion-resistant material to surfaces of installed ferrous anchorage devices.

#### 2.9 INSTALLATION OF VALVES

- A. AWWA Gate Valves: Comply with AWWA C600 and AWWA M44. Install each underground valve with stem pointing up and with valve box.

#### 2.10 CONNECTIONS

- A. Connect water-distribution piping to existing water main.

## SECTION 33 1415

### SITE WATER DISTRIBUTION PIPING

#### 2.11 FIELD QUALITY CONTROL

- A. Piping Tests: Conduct piping tests per Columbia Water & Light specifications. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.
- B. Prepare reports of testing activities.

#### 2.12 IDENTIFICATION

- A. Install continuous underground detectable warning tape during backfilling of trench for underground water-distribution piping. Locate below finished grade, directly over piping. Underground warning tapes are specified in Section 312000 "Earth Moving."

#### 2.13 CLEANING

- A. Clean and disinfect water-distribution piping as follows:
  - 1. Purge new water-distribution piping systems and parts of existing systems that have been altered, extended, or repaired before use.
  - 2. Use purging and disinfecting procedure prescribed by authorities having jurisdiction.
- B. Prepare reports of purging and disinfecting activities.

END OF SECTION 331415



## SECTION 334200

### STORMWATER CONVEYANCE

#### SECTION 334200 - STORMWATER CONVEYANCE

##### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

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

##### 1.2 SUMMARY

- A. Section Includes:
  - 1. Catch Basins

##### 1.3 ACTION SUBMITTALS

- A. Shop Drawings:
  - 1. Manholes: Include plans, elevations, sections, details, frames, and covers.
  - 2. Catch Basins: Include plans, elevations, sections, details, frames, covers, and grates.

##### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Handle catch basins in accordance with manufacturer's written rigging instructions.

##### 1.5 FIELD CONDITIONS

- A. Interruption of Existing Storm Drainage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service in accordance with requirements indicated:
  - 1. Notify Owner no fewer than two weeks in advance of proposed interruption of service.
  - 2. Do not proceed with interruption of service without Owner's written permission.

## PART 2 - PRODUCTS

### 2.1 CONCRETE

- A. General: Cast-in-place concrete in accordance with ACI 318, ACI 350 and the following:
1. Cement: ASTM C150/C150M, Type II.
  2. Fine Aggregate: ASTM C33/C33M, sand.
  3. Coarse Aggregate: ASTM C33/C33M, crushed gravel.
  4. Water: Potable.
- B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio.
1. Reinforcing Fabric: ASTM A1064/A1064M, steel, welded wire fabric, plain.
  2. Reinforcing Bars: ASTM A615/A615M, Grade 60 (420 MPa) deformed steel.
- C. Manhole Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio. Include channels and benches in manholes.
1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
    - a. Invert Slope: **2** percent through manhole.
  2. Benches: Concrete, sloped to drain into channel.
    - a. Slope: **4** percent.

### 2.2 CATCH BASINS

- A. Standard Precast Concrete Catch Basins:
1. Description: ASTM C478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
  2. Base Section: 6-inch minimum thickness for floor slab and 6-inch minimum thickness for walls and base riser section, and separate base slab or base section with integral floor.
  3. Top Section: flat-slab-top type is indicated.
  4. Joint Sealant: ASTM C990 bitumen or butyl rubber.
  5. Adjusting Rings: Interlocking rings with level or sloped edge in thickness and shape matching catch basin frame and grate. Include sealant recommended by ring manufacturer.
  6. Steps: ASTM A615/A615M, deformed, 1/2-inch steel reinforcing rods encased in ASTM D4101, PP, or approved equal, wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step. Cast or anchor

steps into sidewalls at 12- to 16-inch) intervals. Omit steps if total depth from floor of catch basin to finished grade is less than 36 inches.

7. Pipe Connectors: ASTM C923, resilient, of size required, for each pipe connecting to base section.
  
- B. Frames and Grates: ASTM A536, Grade 60-40-18, ductile iron designed for A-16 (AASHTO HS20-44), structural loading. Retain "Frames and Grates" Paragraph below for round, manhole-type structures.

## PART 3 - EXECUTION

### 3.1 EARTHWORK

- A. Excavation, trenching, and backfilling are specified in Section 312000 "Earth Moving."

### 3.2 CATCH BASIN INSTALLATION

- A. Construct catch basins to sizes and shapes indicated.
- B. Set frames and grates to elevations indicated.

### 3.3 CONCRETE PLACEMENT

- A. Place cast-in-place concrete in accordance with ACI 318.

### 3.4 CLOSING ABANDONED STORM DRAINAGE SYSTEMS

- A. Abandoned Piping: Close open ends of abandoned underground piping indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use either procedure below:
  1. Close open ends of piping with at least 24-inch-thick, concrete masonry bulkheads.
  2. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs.
- B. Abandoned Manholes and Structures: Excavate around manholes and structures as required and:
  1. Remove manhole or structure and close open ends of remaining piping indicated to be abandoned in place.
- C. Backfill to grade in accordance with Section 312000 "Earth Moving."

3.5 FIELD QUALITY CONTROL

3.6 CLEANING

A. Clean interior of piping of dirt and superfluous materials.

END OF SECTION 334200