



PROJECT MANUAL

Campsite Renovation and Update Dr. Edmund Babler State Park Wildwood, Missouri

Designed By: Cochran
530A East Independence Drive
Union, MO 63084

Date Issued: September 13, 2023

Project No.: X2312-01

STATE *of* MISSOURI

OFFICE *of* ADMINISTRATION
Facilities Management, Design & Construction

SECTION 000107 - PROFESSIONAL SEALS AND CERTIFICATIONS

PROJECT NUMBER:

(X2312-01 Campsite Renovation and Update; Dr. Edmund Babler State Park; Wildwood, MO)

THE FOLLOWING DESIGN PROFESSIONALS HAVE SIGNED AND SEALED THE ORIGINAL PLANS AND SPECIFICATIONS FOR THIS PROJECT, WHICH ARE ON FILE WITH THE DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION:

CIVIL ENGINEER OF RECORD

Cochran

Elliott R. Reed, P.E.

PE #: MO-2006002845

SHEETS: All sheets except E101, E102, E201, ED201

DIVISION: 31, 32, 33



9-13-23

ELECTRICAL ENGINEER OF RECORD

Case Engineering

Darrell, R. Case, P.E.

PE #: MO-23303

SHEETS: E101, E102, E201, ED201

DIVISION: 26



9-13-23

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section provides a comprehensive list of the drawings that comprise the Bid Documents for this project.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 LIST OF DRAWINGS

- A. The following list of drawings is a part of the Bid Documents:

	<u>TITLE</u>	<u>SHEET #</u>	<u>DATE</u>	<u>CAD #</u>
1.	Cover Sheet	G-001	09/13/2023	
2.	General Notes	C-101	09/13/2023	
3.	Index Sheet	C-102	09/13/2023	
4.	Topographic Survey	C-103	09/13/2023	
5.	Topographic Survey	C-104	09/13/2023	
6.	Topographic Survey	C-105	09/13/2023	
7.	Topographic Survey	C-106	09/13/2023	
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9.	Demolition Plan	C-108	09/13/2023	
10.	Demolition Plan	C-109	09/13/2023	
11.	Demolition Plan	C-110	09/13/2023	
12.	Site Plan	C-111	09/13/2023	
13.	Site Plan	C-112	09/13/2023	
14.	Site Plan	C-113	09/13/2023	
15.	Grading Plan	C-114	09/13/2023	
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17.	Grading Plan	C-116	09/13/2023	
18.	Utility Plan	C-117	09/13/2023	
19.	Utility Plan	C-118	09/13/2023	
20.	Utility Plan	C-119	09/13/2023	
21.	Sanitary Sewer Profile Line #1 STA. 0+00 To 5+20	C-120	09/13/2023	
22.	Sanitary Sewer Profile Line #1 STA. 5+40 to 10+60	C-121	09/13/2023	
23.	Sanitary Sewer Profile Line #1 STA. 10+80 to 16+00	C-122	09/13/2023	
24.	Sanitary Sewer Profile Line #1 STA.16+20 to 21+20	C-123	09/13/2023	
25.	Sanitary Sewer Profile Line #1 STA. 20+00 to 22+00	C-124	09/13/2023	
26.	Sanitary Sewer Profile Line #2 STA. 0+00 to 5+00	C-125	09/13/2023	
27.	Sanitary Sewer Profile Line #2 STA. 5+20 to 10+40	C-126	09/13/2023	
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	<u>TITLE</u>	<u>SHEET #</u>	<u>DATE</u>	<u>CAD #</u>
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37.	Electrical Details & One Line Diagram	E-101	09/13/2023	
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40.	Electrical Site Demolition Plan	ED-201	09/13/2023	

END OF SECTION 000115

SECTION 001116 - INVITATION FOR BID

1.0 OWNER:

- A. The State of Missouri
Office of Administration,
Division of Facilities Management, Design and Construction
Jefferson City, Missouri

2.0 PROJECT TITLE AND NUMBER:

- A. Campsite Renovation and Update
Dr. Edmund Babler State Park
Wildwood, Missouri
Project No.: X2312-01

3.0 BIDS WILL BE RECEIVED:

- A. Until: 1:30 PM, Thursday, January 11, 2024
- B. **Only electronic bids on MissouriBUYS shall be accepted: <https://missouribuys.mo.gov>. Bidder must be registered to bid.**

4.0 DESCRIPTION:

- A. Scope: The project includes improvements of campsites 1-33 and new campsites "A" and "B". The construction will include electrical upgrades to 50 amp service and sewer and water hook ups for each campsite. Two sanitary sewer extensions will be required for service to the site. The upgrade of host campsite 34 is included as Alternate #1.
- B. MBE/WBE/SDVE Goals: MBE 10%, WBE 10%, and SDVE 3%. **NOTE: Only MBE/WBE firms certified by the State of Missouri Office of Equal Opportunity as of the date of bid opening, or SDVE(s) meeting the requirements of Section 34.074, RSMo and 1 CSR 30-5.010, can be used to satisfy the MBE/WBE/SDVE participation goals for this project.**
- C. ****NOTE:** Bidders are provided new Good Faith Effort (GFE) forms on MissouriBUYS.

5.0 PRE-BID MEETING:

- A. Place/Time: 10 AM, Wednesday, December 20, 2023, at Dr. Edmund Babler State Park Visitor Center; 800 Guy Park Dr, Wildwood, MO 63005.
- B. Access to State of Missouri property requires presentation of a photo ID by all persons

6.0 HOW TO GET PLANS & SPECIFICATIONS:

- A. View Only Electronic bid sets are available at no cost or paper bid sets for a deposit of \$100.00 from American Document Solutions (ADS). MAKE CHECKS PAYABLE TO: American Document Solutions. Mail to: American Document Solutions, 1400 Forum Blvd., Suite 7A, Columbia, Missouri 65203. Phone 573-446-7768, Fax 573-355-5433, <https://www.adsplanroom.net>. NOTE: Prime contractors will be allowed a maximum of two bid sets at the deposit rate shown above. Other requesters will be allowed only one bid set at this rate. Additional bid sets or parts thereof may be obtained by any bidder at the cost of printing and shipping by request to American Document Solutions at the address shown above. **Bidder must secure at least one bid set to become a planholder.**
- B. **Refunds: Return plans and specifications in unmarked condition within 15 working days of bid opening to American Document Solutions, 1400 Forum Blvd., Suite 7A, Columbia, Missouri 65203. Phone 573-446-7768, Fax 573-355-5433. Deposits for plans not returned within 15 working days shall be forfeited.**
- C. Information for upcoming bids, including downloadable plans, specifications, Invitation for Bid, bid tabulation, award, addenda, and access to the ADS planholders list, is available on the Division of Facilities Management, Design and Construction's web site: <https://oa.mo.gov/facilities/bid-opportunities/bid-listing-electronic-plans>.

7.0 POINT OF CONTACT:

- A. Designer: Cochran, Elliott Reed, (636) 584-0540, email: ereed@cochraneng.com
- B. Project Manager: Ryan Abbott, (573) 298-1967, email: Ryan.Abbott@oa.mo.gov

8.0 GENERAL INFORMATION:

- A. The State reserves the right to reject any and all bids and to waive all informalities in bids. No bid may be withdrawn for a period of 20 working days subsequent to the specified bid opening time. The contractor shall pay not less than the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed, as determined by the Missouri Department of Labor and Industrial Relations and as set out in the detailed plans and specifications.
- B. Bid results will be available at <https://oa.mo.gov/facilities/bid-opportunities/bid-listing-electronic-plans> after it is verified that at least one bid is awardable and affordable.

Very Important MissouriBUYS Instructions to Help Submit a Bid Correctly

- A. The bidder shall submit his or her bid and all supporting documentation on MissouriBUYS eProcurement System. No hard copy bids shall be accepted. Go to <https://missouribuys.mo.gov> and register. The bidder must register and complete a profile fully with all required documents submitted prior to submitting a bid.
- B. Once registered, log in.
1. Under "Solicitation" select "View Current Solicitations."
 2. Under "Filter by Agency" select "OA-FMDC-Contracts Chapter 8", then click "Filter Solicitation" button.
 3. Select "Active Solicitations" tab.
 4. To see the Solicitation Summary, click on the Project Number and the summary will open. Click each heading to open detailed information.
- C. Here are simplified instructions for uploading the bid to MissouriBUYS:
1. Find the solicitation by completing Steps 1 through 4 above.
 2. Select the three dots under "Actions." Select "Add New Response."
 3. When the Quote box opens, give the response a title and select "OK."
 4. The detailed solicitation will open. Select "Check All" for the Original Solicitation Documents, open each document, and select "Accept." If this step is not completed, a bid cannot be uploaded. Scroll to the bottom of the page and select "Add Attachments." If you do not see this command, not all documents have been opened and accepted.
 5. The Supplier Attachments box will open. Select "Add Attachment" again.
 6. The Upload Documents box will open. Read the instructions for uploading. Disregard the "Confidential" check box.
 7. Browse and attach up to 5 files at a time. Scroll to bottom of box and select "Upload." The Supplier Attachments box will open. Repeat Steps 5 through 7 if more than 5 files are to be uploaded.
 8. When the Supplier Attachments box opens again and uploading is complete, select "Done." A message should appear that the upload is successful. If it does not, go to the Bidder Response tab and select "Submit."
 9. The detailed solicitation will open. At the bottom select "Close."
- D. Any time a bidder wants to modify the bid, he or she will have to submit a new one. FMDC will open the last response the bidder submits. The bidder may revise and submit the bid up to the close of the solicitation (bid date and time). Be sure to allow for uploading time so that the bid is successfully uploaded prior to the 1:30 PM deadline; we can only accept the bid if it is uploaded before the deadline.
- E. If you want to verify that you are uploading documents correctly, please contact Paul Girouard: 573-751-4797, paul.girouard@oa.mo.gov ; April Howser: 573-751-0053, April.Howser@oa.mo.gov ; or Mandy Roberson: 573-522-0074, Mandy.Roberson@oa.mo.gov.
- F. If you are experiencing login issues, please contact Web Procure Support (Proactis) at 866-889-8533 anytime from 7:00 AM to 7:00 PM Central Time, Monday through Friday. If you try using a userid or password several times that is incorrect, the system will lock you out. Web Procure Support is the only option to unlock you! If you forget your userid or password, Web Procure Support will provide a temporary userid or password. Also, if it has been a while since your last successful login and you receive an "inactive" message, contact Web Procure (Proactis). If you are having a registration issue, you may contact Cathy Holliday at 573-751-3491 or by email: cathy.holliday@oa.mo.gov.

IMPORTANT REMINDER REGARDING REQUIREMENT FOR OEO CERTIFICATION

A. SECTION 002113 – INSTRUCTIONS TO
BIDDERS: Article 15.0, Section D1:

As of July 1, 2020, all MBE, WBE, and MBE/WBE contractors, subcontractors, and suppliers must be certified by the State of Missouri, Office of Equal Opportunity. No certifications from other Missouri certifying agencies will be accepted.

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SECTION 002113 – INSTRUCTIONS TO BIDDERS

1.0 - SPECIAL NOTICE TO BIDDERS

- A. If awarded a contract, the Bidder's employees, and the employees of all subcontractors, who perform the work on the project must adhere to requirements in Section 013513 – Site Security and Health Requirements as applicable per Agency.
- B. The Bidder's prices shall include all city, state, and federal sales, excise, and similar taxes that may lawfully be assessed in connection with the performance of work, and the purchased of materials to be incorporated in the work. THIS PROJECT IS NOT TAX EXEMPT.

2.0 - BID DOCUMENTS

- A. The number of sets obtainable by any one (1) party may be limited in accordance with available supply.
- B. For the convenience of contractors, sub-contractors and suppliers, copies of construction documents are on file at the office of the Director, Division of Facilities Management, Design and Construction and on the Division's web site - <https://oa.mo.gov/facilities/bid-opportunities/bid-listing-electronic-plans>.

3.0 - BIDDERS' OBLIGATIONS

- A. Bidders must carefully examine the entire site of the work and shall make all reasonable and necessary investigations to inform themselves thoroughly as to the facilities available as well as to all the difficulties involved in the completion of all work in accordance with the specifications and the plans. Bidders are also required to examine all maps, plans and data mentioned in the specifications. No plea of ignorance concerning observable existing conditions or difficulties that may be encountered in the execution of the work under this contract will be accepted as an excuse for any failure or omission on the part of the contractor to fulfill in every detail all of the requirements of the contract, nor accepted as a basis for any claims for extra compensation.
- B. Under no circumstances will contractors give their plans and specifications to another contractor. Any bid received from a contractor whose name does not appear on the list of plan holders may be subject to rejection.

4.0 - INTERPRETATIONS

- A. No bidder shall be entitled to rely on oral interpretations as to the meaning of the plans and specifications or the acceptability of alternate products, materials, form or type of construction. Every request for interpretation shall be made in writing and submitted with all supporting documents not less than five (5) working days before opening of bids. Every interpretation made to a bidder will be in the form of an addendum and will be sent as promptly as is practicable to all persons to whom plans and specifications have been issued. All such addenda shall become part of the contract documents.
- B. Approval for an "acceptable substitution" issued in the form of an addendum as per Paragraph 4A above, and as per Article 3.1 of the General Conditions; ACCEPTABLE SUBSTITUTIONS shall constitute approval for use in the project of the product.
- C. An "acceptable substitution" requested after the award of bid shall be approved if proven to the satisfaction of the Owner and the Designer as per Article 3.1, that the product is acceptable in design, strength, durability, usefulness, and convenience for the purpose intended. Approval of the substitution after award is at the sole discretion of the Owner.
- D. A request for "Acceptable Substitutions" shall be made on the Section 006325 Substitution Request Form. The request shall be sent directly to the project Designer. A copy of said request should also be mailed to the Owner, Division of Facilities Management, Design and Construction, Post Office Box 809, Jefferson City, Missouri 65102.

5.0 - BIDS AND BIDDING PROCEDURE

- A. Bidders shall submit all submission forms and accompanying documents listed in SECTION 004113 – BID FORM, Article 5.0, ATTACHMENTS TO BID by the stated time or their bid will be rejected for being non-responsive.

Depending on the specific project requirements, **the following is a GENERIC list** of all possible bid forms that may be due with bid submittals and times when they may be due. Please check for specific project requirements on the proposal form (Section 004113). ***Not all of the following bid forms may be required to be submitted.***

Bid Submittal – due before stated date and time of bid opening (see IFB):

004113	Bid Form (all pages are always required)
004322	Unit Prices Form
004336	Proposed Subcontractors Form
004337	MBE/WBE/SDVE Compliance Evaluation Form
004338	MBE/WBE/SDVE Eligibility Determination for Joint Ventures
004339	MBE/WBE/SDVE GFE Determination
004340	SDVE Business Form
004541	Affidavit of Work Authorization
004545	Anti-Discrimination Against Israel Act Certification form

- B. All bids shall be submitted without additional terms and conditions, modification or reservation on the bid forms with each space properly filled. Bids not on these forms will be rejected.
- C. All bids shall be accompanied by a bid bond executed by the bidder and a duly authorized surety company, certified check, cashier's check or bank draft made payable to the Division of Facilities Management, Design and Construction, State of Missouri, in the amount indicated on the bid form, Section 004113. Failure of the contractor to submit the full amount required shall be sufficient cause to reject his bid. The bidder agrees that the proceeds of the check, draft or bond shall become the property of the State of Missouri, if for any reason the bidder withdraws his bid after closing, or if on notification of award refuses or is unable to execute tendered contract, provide an acceptable performance and payment bond, provide evidence of required insurance coverage and/or provide required copies of affirmative action plans within ten (10) working days after such tender.
- D. The check or draft submitted by the successful bidder will be returned after the receipt of an acceptable performance and payment bond and execution of the formal contract. Checks or drafts of all other bidders will be returned within a reasonable time after it is determined that the bid represented by same will receive no further consideration by the State of Missouri. Bid bonds will only be returned upon request.

6.0 - SIGNING OF BIDS

- A. A bid from an individual shall be signed as noted on the Bid Form.
- B. A bid from a partnership or joint venture shall require only one signature of a partner, an officer of the joint venture authorized to bind the venture or an attorney-in-fact. If the bid is signed by an officer of a joint venture or an attorney-in-fact, a document evidencing the individual's authority to execute contracts should be included with the bid form.
- C. A bid from a limited liability company (LLC) shall be signed by a manager or a managing member of the LLC.
- D. A bid from a corporation shall have the correct corporate name thereon and the signature of an authorized officer of the corporation manually written. Title of office held by the person signing for the corporation shall appear, along with typed name of said individual. Corporate license number shall be provided and, if a corporation organized in a state other than Missouri, a Certificate of Authority to do business in the State of Missouri shall be attached. In addition, for corporate proposals, the President or Vice-President should sign as the bidder. If the signator is other than the corporate president or vice president, the bidder must provide satisfactory evidence that the signator has the legal authority to bind the corporation.

- E. A bid should contain the full and correct legal name of the Bidder. If the Bidder is an entity registered with the Missouri Secretary of State, the Bidder's name on the bid form should appear as shown in the Secretary of State's records.
- F. The Bidder should include its corporate license number on the Bid Form and, if the corporation is organized in a state other than Missouri, a Certificate of Authority to do business in the State of Missouri shall be attached to the bid form.

7.0 - RECEIVING BID SUBMITTALS

- A. It is the bidder's sole responsibility to assure receipt by Owner of bid submittals by the date and time specified in the Invitation for Bid. Bids received after the date and time specified shall not be considered by the Owner.
- B. Bids must be submitted through the MissouriBUYS statewide eProcurement system (<https://www.missouribuys.mo.gov/>) in accordance with the instructions for that system. The Owner shall only accept bids submitted through MissouriBUYS. Bids received by the Owner through any other means, including hard copies, shall not be considered and will be discarded by the Owner unopened.
- C. To respond to an Invitation for Bid, the Bidder must first register with MissouriBUYS by going through the MissouriBUYS Home Page (<https://www.missouribuys.mo.gov/>), clicking the "Register" button at the top of the page, and completing the Vendor Registration. Once registered, the Bidder accesses its account by clicking the "Login" button at the top of the MissouriBUYS Home Page. Enter your USERID and PASSWORD, which the Bidder will select. Under Solicitations, select "View Current Solicitations." A new screen will open. Under "Filter by Agency" select "OA-FMDC-Contracts Chapter 8." Under "Filter by Opp. No." type in the State Project Number. Select "Submit." Above the dark blue bar, select "Other Active Opportunities." To see the Solicitation Summary, single click the Opp. No. (Project Number) and the summary will open. Single quick click each blue bar to open detailed information. The Bidder must read and accept the Original Solicitation Documents and complete all identified requirements. The Bidder should download and save all of the Original Solicitation Documents on its computer so that the Bidder can prepare its response to these documents. The Bidder should upload its completed response to the downloaded documents as an attachment to the electronic solicitation response.
- D. Step-by-step instructions for how a registered vendor responds to a solicitation electronically are provided in Section 001116 – Invitation For Bid.
- E. The Bidder shall submit its bid on the forms provided by the Owner on MissouriBUYS with each space fully and properly completed, including all amounts required for alternate bids, unit prices, cost accounting data, etc. The Owner may reject bids that are not on the Owner's forms or that do not contain all requested information.
- F. No Contractor shall stipulate in his bid any conditions not contained in the specifications or standard bid form contained in the contract documents. To do so may subject the Contractor's bid to rejection.
- G. The completed forms shall be without interlineations, alterations or erasures.

8.0 - MODIFICATION AND WITHDRAWAL OF BIDS

- A. Bidder may withdraw his bid at any time prior to scheduled closing time for receipt of bids, but no bidder may withdraw his bid for a period of twenty (20) working days after the scheduled closing time for receipt of bids.
- B. The Bidder shall modify his or her original bid by submitting a revised bid on MissouriBUYS.

9.0 - AWARD OF CONTRACT

- A. The Owner reserves the right to reject any and/or all bids and further to waive all informalities in bidding when deemed in the best interest of the State of Missouri.
- B. The Owner reserves the right to let other contracts in connection with the work, including but not by way of limitation, contracts for the furnishing and installation of furniture, equipment, machines, appliances and other apparatus.

- C. The Owner shall award a contract to the lowest, responsive, responsible Bidder in accordance with Section 8.250, RSMo. No contract will be awarded to any Bidder who has had a contract with the Owner terminated within the preceding twelve months for material breach of contract or who has been suspended or debarred by the Owner.
- D. Award of alternates, if any, will be made in numerical order unless all bids received are such that the order of acceptance of alternates does not affect the determination of the lowest, responsive, responsible bidder.
- E. No bid shall be considered binding upon the Owner until the written contract has been properly executed, a satisfactory bond has been furnished, evidence of required insurance coverage, submittal of executed Section 004541, Affidavit of Work Authorization form, documentation evidencing enrollment and participation in a federal work authorization program has been received and an affirmative action plan submitted. Failure to execute and return the contract and associated documents within the prescribed period of time shall be treated, at the option of the Owner, as a breach of bidder's obligation and the Owner shall be under no further obligation to bidder.
- F. If the successful bidder is doing business in the State of Missouri under a fictitious name, he shall furnish to Owner, attached to the Bid Form, a properly certified copy of the certificate of Registration of Fictitious Name from the State of Missouri, and such certificate shall remain on file with the Owner.
- G. Any successful bidder which is a corporation organized in a state other than Missouri shall furnish to the Owner, attached to the Bid Form, a properly certified copy of its current Certificate of Authority to do business in the State of Missouri, such certificate to remain on file with the Owner. No contract will be awarded by the Owner unless such certificate is furnished by the bidder.
- H. Any successful bidder which is a corporation organized in the State of Missouri shall furnish at its own cost to the Owner, if requested, a Certificate of Good Standing issued by the Secretary of State, such certificate to remain on file with the Owner.
- I. Transient employers subject to Sections 285.230 and 285.234, RSMo, (out-of-state employers who temporarily transact any business in the State of Missouri) may be required to file a bond with the Missouri Department of Revenue. No contract will be awarded by the Owner unless the successful bidder certifies that he has complied with all applicable provisions of Section 285.230-234.
- J. Sections 285.525 and 285.530, RSMo, require business entities to enroll and participate in a federal work authorization program in order to be eligible to receive award of any state contract in excess of \$5,000. Bidders should submit with their bid an Affidavit of Work Authorization (Section 004541) along with appropriate documentation evidencing such enrollment and participation. Section-004541, Affidavit of Work Authorization is located on the MissouriBUYS solicitation for this project. Bidders must also submit an E-Verify Memorandum before the Owner may award a contract to the Bidder. Information regarding an E-Verify is located at <https://www.uscis.gov/e-verify/>. The contractor shall be responsible for ensuring that all subcontractors and suppliers associated with this contract enroll in E-Verify.

10.0 - CONTRACT SECURITY

- A. The successful bidder shall furnish a performance/payment bond as set forth in General Conditions Article 6.1 on a condition prior to the State executing the contract and issuing a notice to proceed.

11.0 - LIST OF SUBCONTRACTORS

- A. If required by "Section 004113 – Bid Form," each bidder must submit as part of their bid a list of subcontractors to be used in performing the work (Section 004336). The list must specify the name of the single designated subcontractor, for each category of work listed in "Section 004336 - Proposed Subcontractors Form." If work within a category will be performed by more than one subcontractor, the bidder must provide the name of each subcontractor and specify the exact portion of the work to be done by each. Failure to list the Bidder's firm, or a subcontractor for each category of work identified on the Bid Form or the listing of more than one subcontractor for any category without designating the portion of work to be performed by each shall be cause for rejection of the bid. If the bidder intends to perform any of the designated subcontract work with the use of his own employees, the bidder shall make that fact clear, by listing his own firm for the subject category. **If any category of work is left vacant, the bid shall be rejected.**

12.0 - WORKING DAYS

- A. Contract duration time is stated in working days and will use the following definition in determining the actual calendar date for contract completion:
 - 1. Working days are defined as all calendar days except Saturdays, Sundays and the following State of Missouri observed holidays: New Year's Day, Martin Luther King, Jr. Day, Lincoln Day, Washington's Birthday, Truman Day, Memorial Day, Juneteenth, Independence Day, Labor Day, Columbus Day, Veterans Day, Thanksgiving Day and Christmas Day.

13.0 - AMERICAN AND MISSOURI - MADE PRODUCTS AND FIRMS

- A. By signing the bid form and submitting a bid on this project, the Bidder certifies that it will use American and Missouri products as set forth in Article 1.7 of the General Conditions. Bidders are advised to review those requirements carefully prior to bidding.
- B. A preference shall be given to Missouri firms, corporations or individuals, or firms, corporations or individuals that maintain Missouri offices or places of business, when the quality of performance promised is equal or better and the price quoted is the same or less.
- C. Pursuant to Section 34.076, RSMo, a contractor or Bidder domiciled outside the boundaries of the State of Missouri shall be required, in order to be successful, to submit a bid the same percent less than the lowest bid submitted by a responsible contractor or Bidder domiciled in Missouri as would be required for such a Missouri domiciled contractor or Bidder to succeed over the bidding contractor or Bidder domiciled outside Missouri on a like contract or bid being let in the person's domiciliary state and, further, the contractor or Bidder domiciled outside the boundaries of Missouri shall be required to submit an audited financial statement as would be required of a Missouri domiciled contractor or Bidder on a like contract or bid being let in the domiciliary state of that contractor or Bidder.

14.0 – ANTI-DISCRIMINATION AGAINST ISRAEL ACT CERTIFICATION:

- A. Pursuant to section 34.600, RSMo, if the Bidder meets the section 34.600, RSMo, definition of a “company” and the Bidder has ten or more employees, the Bidder must certify in writing that the Bidder is not currently engaged in a boycott of goods or services from the State of Israel as defined in section 34.600, RSMo, and shall not engage in a boycott of goods or services from the State of Israel, if awarded a contract, for the duration of the contract. The Bidder is requested to complete and submit the applicable portion of Section 004545 - Anti-Discrimination Against Israel Act Certification with their Bid Form. The applicable portion of the exhibit must be submitted prior to execution of a contract by the Owner and issuance of Notice to Proceed. If the exhibit is not submitted, the Owner shall rescind its Intent to Award and move to the next lowest, responsive, responsible bidder.

15.0 - MBE/WBE/SDVE INSTRUCTIONS

- A. Definitions:
 - 1. “**MBE**” means a Minority Business Enterprise.
 - 2. “**MINORITY**” has the same meaning as set forth in 1 C.S.R. 10-17.010.
 - 3. “**MINORITY BUSINESS ENTERPRISE**” has the same meaning as set forth in section 37.020, RSMo.
 - 4. “**WBE**” means a Women’s Business Enterprise.
 - 5. “**WOMEN’S BUSINESS ENTERPRISE**” has the same meaning as set forth in section 37.020, RSMo.
 - 6. “**SDVE**” means a Service-Disabled Veterans Enterprise.
 - 7. “**SERVICE-DISABLED VETERAN**” has the same meaning as set forth in section 34.074, RSMo.
 - 8. “**SERVICE-DISABLED VETERAN ENTERPRISE**” has the same meaning as “Service-Disabled Veteran Business” set forth in section 34.074, RSMo.

B. MBE/WBE/SDVE General Requirements:

1. For all bids greater than \$100,000, the Bidder shall obtain MBE, WBE and SDVE participation in an amount equal to or greater than the percentage goals set forth in the Invitation for Bid and the Bid Form, unless the Bidder is granted a Good Faith Effort waiver by the Director of the Division, as set forth below. If the Bidder does not meet the MBE, WBE and SDVE goals, or make a good faith effort to do so, the Bidder shall be non-responsive, and its bid shall be rejected.
2. The Bidder should submit with its bid all of the information requested in the MBE/WBE/SDVE Compliance Evaluation Form for every MBE, WBE, or SDVE subcontractor or material supplier the Bidder intends to use for the contract work. The Bidder is required to submit all appropriate MBE/WBE/SDVE documentation before the stated time and date set forth in the Invitation for Bid. If the Bidder fails to provide such information by the specified date and time, the Owner shall reject the bid.
3. The Director reserves the right to request additional information from a Bidder to clarify the Bidder's proposed MBE, WBE, and/or SDVE participation. The Bidder shall submit the clarifying information requested by the Owner within two (2) Working Days of receiving the request for clarification.
4. Pursuant to section 34.074, RSMo, a Bidder that is a SDVE doing business as Missouri firm, corporation, or individual, or that maintains a Missouri office or place of business, shall receive a three-point bonus preference in the contract award evaluation process. The bonus preference will be calculated and applied by reducing the bid amount of the eligible SDVE by three percent of the apparent low responsive bidder's bid. Based on this calculation, if the eligible SDVE's evaluation is less than the apparent low responsive bidder's bid, the eligible SDVE's bid becomes the apparent low responsive bid. This reduction is for evaluation purposes only, and will have no impact on the actual amount(s) of the bid or the amount(s) of any contract awarded. In order to be eligible for the SDVE preference, the Bidder must complete and submit with its bid the Missouri Service Disabled Veteran Business Form, and any information required by the form. The form is available on the MissouriBUYS solicitation for this project.

C. Computation of MBE/WBE/SDVE Goal Participation:

1. A Bidder who is a MBE, WBE, or SDVE may count 100% of the contract towards the MBE, WBE or SDVE goal, less any amounts awarded to another MBE, WBE or SDVE. (NOTE: A MBE firm that bids as general contractor must obtain WBE and SDVE participation; a WBE firm that bids as a general contractor must obtain MBE and SDVE participation; and a SDVE firm that bids as general contractor must obtain MBE and WBE participation.) In order for the remaining contract amount to be counted towards the MBE, WBE or SDVE goal, the Bidder must complete the MBE/WBE/SDVE Compliance Evaluation Form (Section 004337) identifying itself as an MBE, WBE or SDVE.
2. The total dollar value of the work granted to a certified MBE, WBE or SDVE by the Bidder shall be counted towards the applicable goal.
3. Expenditures for materials and supplies obtained from a certified MBE, WBE, or SDVE supplier or manufacturer may be counted towards the MBE, WBE and SDVE goals, if the MBE, WBE, or SDVE assumes the actual and contractual responsibility for the provision of the materials and supplies.
4. The total dollar value of the work granted to a second or subsequent tier subcontractor or a supplier may be counted towards a Bidder's MBE, WBE and SDVE goals, if the MBE, WBE, or SDVE properly assumes the actual and contractual responsibility for the work.
5. The total dollar value of work granted to a certified joint venture equal to the percentage of the ownership and control of the MBE, WBE, or SDVE partner in the joint venture may be counted towards the MBE/WBE/SDVE goals.
6. Only expenditures to a MBE, WBE, or SDVE that performs a commercially useful function in the work may be counted towards the MBE, WBE and SDVE goals. A MBE, WBE, or SDVE performs 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 or providing supplies or manufactured materials.

D. Certification of MBE/WBE/SDVE Subcontractors:

1. In order to be counted towards the goals, an MBE or WBE must be certified by the State of Missouri Office of Equal Opportunity and an SDVE must be certified by the State of Missouri, Office of Administration, Division of Purchasing and Material Management or by the Department of Veterans Affairs.
2. The Bidder may determine the certification status of a proposed MBE or WBE subcontractor or supplier by referring to the Office of Equal Opportunity (OEO)'s online MBE/WBE directory (<https://apps1.mo.gov/MWBCertifiedFirms/>). The Bidder may determine the eligibility of a SDVE subcontractor or supplier by referring to the Division of Purchasing and Materials Management's online SDVE directory (<https://oa.mo.gov/sites/default/files/sdvelisting.pdf>) or the Department of Veterans Affairs' directory (<https://vetbiz.va.gov/basic-search/>).
3. Additional information, clarifications, etc., regarding the listings in the directories may be obtained by calling the Division at (573)751-3339 and asking to speak to the Contract Specialist of record as shown in the Supplementary Conditions (Section 007300).

E. Waiver of MBE/WBE/SDVE Participation:

1. If a Bidder has made a good faith effort to secure the required MBE, WBE and/or SDVE participation and has failed, the Bidder shall submit with its bid the information requested in MBE/WBE/SDVE Good Faith Effort (GFE) Determination form. The GFE forms are located on the MissouriBUYS solicitation for this project. The Director will determine if the Bidder made a good faith effort to meet the applicable goals. If the Director determines that the Bidder did not make a good faith effort, the bid shall be rejected as being nonresponsive to the bid requirements. Bidders who demonstrate that they have made a good faith effort to include MBE, WBE, and/or SDVE participation will be determined to be responsive to the applicable participation goals, regardless of the percent of actual participation obtained, if the bid is otherwise acceptable.
2. In determining whether a Bidder has made a good faith effort to obtain MBE, WBE and/or SDVE participation, the Director may evaluate the factors set forth in 1 CSR 30-5.010(6)(C) and the following:
 - a. The amount of actual participation obtained;
 - b. How and when the Bidder contacted potential MBE, WBE, and SDVE subcontractors and suppliers;
 - c. The documentation provided by the Bidder to support its contacts, including whether the Bidder provided the names, addresses, phone numbers, and dates of contact for MBE/WBE/SDVE firms contacted for specific categories of work;
 - d. If project information, including plans and specifications, were provided to MBE/WBE/SDVE subcontractors;
 - e. Whether the Bidder made any attempts to follow-up with MBE, WBE or SDVE firms prior to bid;
 - f. Amount of bids received from any of the subcontractors and/or suppliers that the Bidder contacted;
 - g. The Bidder's stated reasons for rejecting any bids;
3. If no bidder has obtained any participation in a particular category (MBE/WBE/SDVE) or made a good faith effort to do so, the Director may waive that goal rather than rebid.

F. Contractor MBE/WBE/SDVE Obligations

1. If awarded a contract, the Bidder will be contractually required to subcontract with or obtain materials from the MBE, WBE, and SDVE firms listed in its bid, in amounts equal to or greater than the dollar amount bid, unless the amount is modified in writing by the Owner.
2. If the Contractor fails to meet or maintain the participation requirements contained in the Contractor's bid, the Contractor must satisfactorily explain to the Director why it cannot comply with the requirement and why failing meeting the requirement was beyond the Contractor's control. If the Director finds the Contractor's explanation unsatisfactory, the Director may take any appropriate action including, but not limited to:
 - a. Declaring the Contractor ineligible to participate in any contracts with the Division for up to twelve (12) months (suspension); and/or
 - b. Declaring the Contractor be non-responsive to the Invitation for Bid, or in breach of contract and rejecting the bid or terminating the contract.
3. If the Contractor replaces an MBE, WBE, or SDVE during the course of this contract, the Contractor shall replace it with another MBE, WBE, or SDVE or make a good faith effort to do so. All MBE, WBE and SDVE substitutions must be approved by the Director.
4. The Contractor shall provide the Owner with regular reports on its progress in meeting its MBE/WBE/SDVE obligations. At a minimum, the Contractor shall report the dollar-value of work completed by each MBE, WBE, or SDVE during the preceding month and the cumulative total of work completed by each MBE, WBE or SDVE to date with each monthly application for payment. The Contractor shall also make a final report, which shall include the total dollar-value of work completed by each MBE, WBE, and SDVE during the entire contract.

**STATE OF MISSOURI
DIVISION OF FACILITIES MANAGEMENT,
DESIGN AND CONSTRUCTION
*MBE/WBE/SDVE DIRECTORIES***

The MBE/WBE Directory for goods and services is maintained by the Office of Equal Opportunity (OEO) and is located at the following web address:

<https://apps1.mo.gov/MWBCertifiedFirms/>

The SERVICE DISABLED VETERAN ENTERPRISE (SDVE) Directories may be accessed at the following web addresses:

<https://o eo .mo .gov /sdve -certification -program />

<https://veterans.certify.sba.gov/#search>

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State of Missouri Construction Contract

THIS AGREEMENT is made (DATE) by and between:

Contractor Name and Address

hereinafter called the "Contractor,"

and the **State of Missouri**, hereinafter called the "**Owner**", represented by the Office of Administration, Division of Facilities Management, Design and Construction.

WITNESSETH, that the Contractor and the Owner, for the consideration stated herein agree as follows:

ARTICLE 1. STATEMENT OF WORK

The Contractor shall furnish all labor and materials and perform all work required for furnishing and installing all labor, materials, equipment and transportation and everything necessarily inferred from the general nature and tendency of the plans and specifications for the proper execution of the work for:

Project Name: **Campsite Renovation and Update
Dr. Edmund Babler State Park
Wildwood, Missouri**

Project Number: **X2312-01**

in strict accordance with the Contract Documents as enumerated in Article 7, all of which are made a part hereof.

ARTICLE 2. TIME OF COMPLETION

The contract performance time is **120 working days** from the transmittal date of this agreement. The contract completion date is **MONTH, DAY, YEAR**. This time includes ten (10) working days for the Contractor to receive, sign and return the contract form along with required bonding and insurance certificates. Failure of the Contractor to provide correct bonding and insurance within the ten (10) working days shall not be grounds for a time extension. Receipt of proper bonding and insurance is a condition precedent to the formation of the contract and if not timely received, may result in forfeiture of the Contractor's bid security. Work may not commence until the Owner issues a written Notice to Proceed and must commence within seven (7) working days thereafter.

ARTICLE 3. LIQUIDATED DAMAGES

Whenever time is mentioned in this contract, time shall be and is of the essence of this contract. The Owner would suffer a loss should the Contractor fail to have the work embraced in this contract fully completed on or before the time above specified. **THEREFORE**, the parties hereto realize in order to adjust satisfactorily the damages on account of such failure that it might be impossible to compute accurately or estimate the amount of such loss or damages which the Owner would sustain by reason of failure to complete fully said work within the time required by this contract. The Contractor hereby covenants and agrees to pay the Owner, as and for **liquidated damages, the sum of \$1,000** per day for each and every day, Sunday and legal holidays excepted, during which the work remains incomplete and unfinished. Any sum which may be due the Owner for such damages shall be deducted and retained by the Owner from any balance which may be due the Contractor when said work shall have been finished and accepted. But such provisions shall not release the Bond of the Contractor from liability according to its terms. In case of failure to complete, the Owner will be under no obligation to show or prove any actual or specific loss or damage.

ARTICLE 4. CONTRACT SUM

The Owner shall pay the Contractor for the prompt, faithful and efficient performance of the conditions and undertakings of this contract, subject to additions, and deductions as provided herein, in current funds the sum of:

Base Bid: \$

Alternate No. 1: \$

TOTAL CONTRACT AMOUNT: (\$CONTRACT AMOUNT)

UNIT PRICES: The Owner accepts the following Unit Prices: Not Applicable

For changing specified quantities of work from those indicated by the contract drawings and specifications, upon written instructions of Owner, the following unit prices shall prevail. The unit prices include all labor, overhead and profit, materials, equipment, appliances, bailing, shoring, shoring removal, etc., to cover the finished work of the several kinds of work called for. Only a single unit price shall be given and it shall apply for either MORE or LESS work than that shown on the drawings and called for in the specifications or included in the Base Bid. In the event of more or less units than so indicated or included, change orders may be issued for the increased or decreased amount.

ARTICLE 5. PREVAILING WAGE RATE

MISSOURI PREVAILING WAGE LAW (Sections 290.210 to 290.340, RSMo): The Contractor shall pay not less than the specified hourly rate of wages, as set out in the wage order attached to and made part of the specifications for work under this contract, to all workers performing work under the contract, in accordance with sections 290.210 to 290.340, RSMo. The Contractor shall forfeit a penalty to the Owner of one hundred dollars per day (or portion of a day) for each worker that is paid less than the specified rates for any work done under the contract by the Contractor or by any subcontractor, in accordance with section 290.250, RSMo.

DAVIS-BACON ACT: If this Project is financed in whole or in part from Federal funds (as indicated in the Instructions to Bidders or other bid or contract documents for this Project), then this contract shall be subject to all applicable federal labor statutes, rules and regulations, including provisions of the Davis-Bacon Act, 40 U.S.C. §3141 et seq., and the “Federal Labor Standards Provisions,” as further set forth in Section 007333 – Supplementary General Conditions for Federally Funded/Assisted Construction Projects, which is incorporated into the contract by reference. Where the Missouri Prevailing Wage Law and the Davis-Bacon Act require payment of different wages for work performed under this contract, the Contractor and all Subcontractors shall pay the greater of the wages required under either law, on a classification by classification basis.

ARTICLE 6. MINORITY/WOMEN/SERVICE DISABLED VETERAN BUSINESS ENTERPRISE PARTICIPATION

The Contractor has been granted a waiver of the 10% MBE and 10% WBE and 3% SDVE participation goals. The Contractor agrees to secure the MBE/WBE/SDVE participation amounts for this project as follows: (OR)

The Contractor has met the MBE/WBE/SDVE participation goals and agrees to secure the MBE/WBE/SDVE participation amounts for this project as follows:

MBE/WBE/SDVE Firm: Subcontract Amt:\$
MBE/WBE/SDVE Firm: Subcontract Amt:\$
MBE/WBE/SDVE Firm: Subcontract Amt:\$

Total \$

MBE/WBE/SDVE assignments identified above shall not be changed without a contract change signed by the Owner.

The Director of the Division of Facilities Management, Design and Construction or his Designee shall be the final authority to resolve disputes and disagreements between the Contractor and the MBE/WBE/SDVE firms listed above when such disputes impact the subcontract amounts shown above.

ARTICLE 7. CONTRACT DOCUMENTS

The following documents are hereby incorporated into this contract by reference (all division/section numbers and titles are as utilized in the Project Manual published by the Owner for this Project):

1. Division 0 – Procurement and Contracting Information, including, but not limited to:
 - a. Invitation for Bid (Section 001116)
 - b. Instructions to Bidders (Section 002113)
 - c. Supplementary Instructions to Bidders (if applicable) (Section 002213)
 - d. The following documents as completed and executed by the Contractor and accepted by the Owner, if applicable:
 - i. Bid Form (Section 004113)
 - ii. Unit Prices (Section 004322)
 - iii. Proposed Contractors Form (Section 004336)
 - iv. MBE, WBE, SDVE Compliance Evaluation Form(s) (Section 004337)
 - v. MBE, WBE, SDVE Eligibility Determination Form for Joint Ventures (Section 004338)
 - vi. MBE, WBE, SDVE Good Faith Effort (GFE) Determination Form (Section 004339)
 - vii. Missouri Service Disabled Veteran Business Form (Section 004340)
 - viii. Affidavit of Work Authorization (Section 004541)
 - ix. Affidavit for Affirmative Action (Section 005414)
 - e. Performance and Payment Bond, completed and executed by the Contractor and surety (Section 006113)
 - f. General Conditions (Section 007213)
 - g. Supplementary Conditions (Section 007300)
 - h. Supplementary General Conditions for Federally Funded/Assisted Construction Projects (Section 007333)
 - i. Wage Rate(s) (Section 007346)
2. Division 1 – General Requirements
3. All Drawings identified in the Project Manual
4. All Technical Specifications included in the Project Manual
5. Addenda, if applicable

ARTICLE 8 – CERTIFICATION

By signing this contract, the Contractor hereby re-certifies compliance with all legal requirements set forth in Section 6.0, Bidder’s Certifications of the Bid Form.

Further, if the Contractor provides any “personal information” as defined in §105.1500, RSMo concerning an entity exempt from federal income tax under Section 501(c) of the Internal Revenue Code of 1986, as amended, the Contractor understands and agrees that it is voluntarily choosing to enter into a state contract and providing such information for that purpose. The state will treat such personal information in accord with §105.1500, RSMo.

By signature below, the parties hereby execute this contract document.

APPROVED:

Brian Yansen, Director
Division of Facilities Management,
Design and Construction

Contractor's Authorized Signature

I, Corporate Secretary, certify that I am Secretary of the corporation named above and that (CONTRACTOR NAME), who signed said contract on behalf of the corporation, was then (TITLE) of said corporation and that said contract was duly signed for and in behalf of the corporation by authority of its governing body, and is within the scope of its corporate powers.

Corporate Secretary



STATE OF MISSOURI
 OFFICE OF ADMINISTRATION
 DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION
AFFIDAVIT FOR AFFIRMATIVE ACTION

PROJECT NUMBER

NAME

First being duly sworn on oath states: that

he/she is the sole proprietor partner officer or manager or managing member of

NAME

a sole proprietorship partnership
 limited liability company (LLC)

or corporation, and as such, said proprietor, partner, or officer is duly authorized to make this

affidavit on behalf of said sole proprietorship, partnership, or corporation; that under the contract known as

PROJECT TITLE

Less than 50 persons in the aggregate will be employed and therefore, the applicable Affirmative Action requirements as set forth in Article 1.4 of the General Conditions of the State of Missouri have been met.

PRINT NAME & SIGNATURE

DATE

--

NOTARY INFORMATION

NOTARY PUBLIC EMBOSSER SEAL

STATE OF

COUNTY (OR CITY OF ST. LOUIS)

USE RUBBER STAMP IN CLEAR AREA BELOW

SUBSCRIBED AND SWORN BEFORE ME, THIS
DAY OF
YEAR

NOTARY PUBLIC SIGNATURE

MY COMMISSION EXPIRES

NOTARY PUBLIC NAME (TYPED OR PRINTED)

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SECTION 006113 - PERFORMANCE AND PAYMENT BOND FORM

KNOW ALL MEN BY THESE PRESENTS, THAT we _____

as principal, and _____

_____ as Surety, are held and firmly bound unto the

STATE OF MISSOURI. in the sum of _____ Dollars (\$ _____)

for payment whereof the Principal and Surety bind themselves, their heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

WHEREAS, the Principal has, by means of a written agreement dated the _____

day of _____, 20_____, enter into a contract with the State of Missouri for

(Insert Project Title and Number)

NOW, THEREFORE, if the Principal shall faithfully perform and fulfill all the undertakings, covenants, terms, conditions and agreements of said contract during the original term of said contract and any extensions thereof that may be granted by the State of Missouri, with or without notice to the Surety and during the life of any guaranty required under the contract; and shall also faithfully perform and fulfill all undertakings, covenants, terms, conditions and agreements of any and all duly authorized modifications of said contract that may hereafter be made with or without notice to the Surety; and shall also promptly make payment for materials incorporated, consumed or used in connection with the work set forth in the contract referred to above, and all insurance premiums, both compensation and all other kinds of insurance, on said work, and for all labor performed on such work, whether by subcontractor or otherwise, at not less than the prevailing hourly rate of wages for work of a similar character (exclusive of maintenance work) in the locality in which the work is performed and not less than the prevailing hourly rate of wages for legal holiday and overtime work (exclusive of maintenance work) in the locality in which the work is performed both as determined by the Department of Labor and Industrial Relations or determined by the Court of Appeal, as provided for in said contract and in any and all duly authorized modifications of said contract that may be hereafter made, with or without notice to the Surety, then, this obligation shall be void and of no effect, but it is expressly understood that if the Principal should make default in or should fail to strictly, faithfully and efficiently do, perform and comply with any or more of the covenants, agreements, stipulations, conditions, requirements or undertakings, as specified in or by the terms of said contract, and with the time therein named, then this obligation shall be valid and binding upon each of the parties hereto and this bond shall remain in full force and effect; and the same may be sued on at the instance of any material man, laborer, mechanic, subcontractor, individual, or otherwise to whom such payment is due, in the name of the State of Missouri, to the use of any such person.

AND, IT IS FURTHER specifically provided that any modifications which may hereinafter be made in the terms of the contract or in the work to be done under it or the giving by the Owner of any extension of the time for the performance of the contract or any other forbearance on the part of either the Owner or the Principal to the other, shall not in any way release the Principal and the Surety, or either or any of them, their heirs, executors, administrators and successors, from their liability hereunder, notice to the Surety of any such extension, modifications or forbearance being hereby waived.

IN WITNESS WHEREOF, the above bounden parties have executed the within instrument this _____ day of _____, 20 ____.

AS APPLICABLE:

AN INDIVIDUAL

Name: _____

Signature: _____

A PARTNERSHIP

Name of Partner: _____

Signature of Partner: _____

Name of Partner: _____

Signature of Partner: _____

CORPORATION

Firm Name: _____

Signature of President: _____

SURETY

Surety Name: _____

Attorney-in-Fact: _____

Address of Attorney-in-Fact: _____

Telephone Number of Attorney-in-Fact: _____

Signature Attorney-in-Fact: _____

NOTE: Surety shall attach Power of Attorney



STATE OF MISSOURI
 OFFICE OF ADMINISTRATION
 DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION
PRODUCT SUBSTITUTION REQUEST

PROJECT NUMBER

PROJECT TITLE AND LOCATION

CHECK APPROPRIATE BOX

SUBSTITUTION PRIOR TO BID OPENING
 (Minimum of (5) working days prior to receipt of Bids as per Article 4 – Instructions to Bidders)

SUBSTITUTION FOLLOWING AWARD
 (Maximum of (20) working days from Notice to Proceed as per Article 3 – General Conditions)

FROM: BIDDER/CONTRACTOR (PRINT COMPANY NAME)

TO: ARCHITECT/ENGINEER (PRINT COMPANY NAME)

Bidder/Contractor hereby requests acceptance of the following product or systems as a substitution in accordance with provisions of Division One of the Bidding Documents:

SPECIFIED PRODUCT OR SYSTEM

SPECIFICATION SECTION NO.

SUPPORTING DATA

Product data for proposed substitution is attached (include description of product, standards, performance, and test data)

Sample Sample will be sent, if requested

QUALITY COMPARISON

	SPECIFIED PRODUCT	SUBSTITUTION REQUEST
NAME, BRAND		
CATALOG NO.		
MANUFACTURER		
VENDOR		

PREVIOUS INSTALLATIONS

PROJECT	ARCHITECT/ENGINEER
LOCATION	DATE INSTALLED

SIGNIFICANT VARIATIONS FROM SPECIFIED PRODUCT

REASON FOR SUBSTITUTION

DOES PROPOSED SUBSTITUTION AFFECT OTHER PARTS OF WORK?

YES NO

IF YES, EXPLAIN

SUBSTITUTION REQUIRES DIMENSIONAL REVISION OR REDESIGN OF STRUCTURE OR A/E WORK

YES NO

BIDDER'S/CONTRACTOR'S STATEMENT OF CONFORMANCE OF PROPOSED SUBSTITUTION TO CONTRACT REQUIREMENT:

We have investigated the proposed substitution. We believe that it is equal or superior in all respects to specified product, except as stated above; that it will provide the same Warranty as specified product; that we have included complete implications of the substitution; that we will pay redesign and other costs caused by the substitution which subsequently become apparent; and that we will pay costs to modify other parts of the Work as may be needed, to make all parts of the Work complete and functioning as a result of the substitution.

BIDDER/CONTRACTOR

DATE

REVIEW AND ACTION

Resubmit Substitution Request with the following additional information:

Substitution is accepted.

Substitution is accepted with the following comments:

Substitution is not accepted.

ARCHITECT/ENGINEER

DATE



PROJECT NUMBER

KNOW ALL MEN BY THESE PRESENT THAT: hereinafter called "Subcontractor" who heretofore entered into an agreement with hereinafter called "Contractor", for the performance of work and/or furnishing of material for the construction of the project entitled

(PROJECT TITLE, PROJECT LOCATION, AND PROJECT NUMBER)

at

 (ADDRESS OF PROJECT)

for the State of Missouri (Owner) which said subcontract is by this reference incorporated herein, in consideration of such final payment by Contractor.

DOES HEREBY:

1. ACKNOWLEDGE that they have been **PAID IN FULL** all sums due for work and materials contracted or done by their Subcontractors, Material Vendors, Equipment and Fixture Suppliers, Agents and Employees, or otherwise in the performance of the Work called for by the aforesaid Contract and all modifications or extras or additions thereto, for the construction of said project or otherwise.
2. RELEASE and fully, finally, and forever discharge the Owner from any and all suits, actions, claims, and demands for payment for work performed or materials supplied by Subcontractor in accordance with the requirements of the above referenced Contract.
1. REPRESENT that all of their Employees, Subcontractors, Material Vendors, Equipment and Fixture Suppliers, and everyone else has been **paid in full** all sums due them, or any of them, in connection with performance of said Work, or anything done or omitted by them, or any of them in connection with the construction of said improvements, or otherwise.

DATED this day of , 20 .

NAME OF SUBCONTRACTOR

BY (TYPED OR PRINTED NAME)

SIGNATURE

TITLE

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STATE OF MISSOURI
 OFFICE OF ADMINISTRATION
 DIVISION OF FACILITIES MANAGEMENT,
 DESIGN AND CONSTRUCTION

MBE/WBE/SDVE PROGRESS REPORT

Remit with **ALL** Progress and Final Payments

(Please check appropriate box) CONSULTANT CONSTRUCTION

PAY APP NO.	PROJECT NUMBER
CHECK IF FINAL <input checked="" type="checkbox"/> FINAL	DATE

PROJECT TITLE

PROJECT LOCATION

FIRM

ORIGINAL CONTRACT SUM (Same as Line Item 1. on Form A of Application for Payment)
\$

TOTAL CONTRACT SUM TO DATE (Same as Line Item 3. on Form A of Application for Payment)
\$

THE TOTAL MBE/WBE/SDVE PARTICIPATION DOLLAR AMOUNT OF THIS PROJECT AS INDICATED IN THE ORIGINAL CONTRACT: \$

SELECT MBE, WBE, SDVE	ORIGINAL CONTRACT PARTICIPATION AMOUNT	PARTICIPATION AMOUNT PAID-TO-DATE (includes approved contract changes)	CONSULTANT/SUBCONSULTANT OR CONTRACTOR/SUBCONTRACTOR/SUPPLIER COMPANY NAME
<input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SDVE	\$	\$	
<input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SDVE	\$	\$	
<input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SDVE	\$	\$	
<input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SDVE	\$	\$	
<input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SDVE	\$	\$	
<input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SDVE	\$	\$	

INSTRUCTIONS FOR MBE/WBE/SDVE PROGRESS REPORT

CONTRACTOR OR CONSULTANT TO FILL OUT AND REMIT WITH EACH PAY APPLICATION:

The MBE/WBE/SDVE Progress Report for the project is issued with the contract comprising values reported in the consultant's Proposal or on the successful contractor's Section 004337 Compliance Evaluation Forms.

At Initial Pay Application fill in the following:

1. Pay App No. Start with 1.
2. Fill in the Project Number and Date.
3. Enter Project Title, Project Location, and Firm.
4. Fill in the "Original Contract Sum" and "Total Contract Sum To Date" (Reference applicable Line Items on Form A of Application for Payment).
5. Indicate the Total Participation Dollar Amount from the Original Contract.
6. Select MBE, WBE, or SDVE for each Consultant/Subconsultant or Contractor/Subcontractor/Supplier.
7. Enter the "Total Amount of Subcontract", "\$ Amount (Paid-To-Date)", and Company Name.

For all subsequent Pay Applications fill in the following:

1. Pay App No.
2. If Final Pay App, check box.
3. Fill in the Project Number and Date.
4. Enter Project Title, Project Location, and Firm
5. At each Pay App fill in the "Original Contract Sum" and "Total Contract Sum To Date" (reference applicable Line Items on Form A of Application for Payment).
6. Indicate the Total Participation Dollar Amount from the Original Contract.
7. Select MBE, WBE, or SDVE for each Consultant/Subconsultant or Contractor/Subcontractor/Supplier
8. Enter the "Total Amount of Subcontract", "\$ Amount (Paid-To-Date)", and Company Name.



STATE OF MISSOURI
 OFFICE OF ADMINISTRATION
 DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION
AFFIDAVIT – COMPLIANCE WITH PREVAILING WAGE LAW

PROJECT NUMBER

Before me, the undersigned Notary Public, in and for the County of _____

State of _____ personally came and appeared _____

(NAME)

_____ of the _____

(POSITION) (NAME OF THE COMPANY)

(a corporation) (a partnership) (a proprietorship) and after being duly sworn did depose and say that all provisions and requirements set out in Chapter 290, Sections 290.210 through and including 290.340, Missouri Revised Statutes, pertaining to the payment of wages to workmen employed on public works project have been fully satisfied and there has been no exception to the full and completed compliance with said provisions and requirements and with Wage Determination No: _____ issued by the Department of Labor and Industrial Relations, State of Missouri on the _____ day of _____ 20 _____ in carrying out the contract and working in connection with _____

(NAME OF PROJECT)

Located at _____ in _____ County

(NAME OF THE INSTITUTION)

Missouri, and completed on the _____ day of _____ 20 _____

SIGNATURE

NOTARY INFORMATION

NOTARY PUBLIC EMBOSSEER OR BLACK INK RUBBER STAMP SEAL	STATE	COUNTY (OR CITY OF ST. LOUIS)
	SUBSCRIBED AND SWORN BEFORE ME, THIS	
	DAY OF	YEAR
	NOTARY PUBLIC SIGNATURE	MY COMMISSION EXPIRES
NOTARY PUBLIC NAME (TYPED OR PRINTED)		USE RUBBER STAMP IN CLEAR AREA BELOW

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GENERAL CONDITIONS

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- 1.5. Anti-Kickback
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- 1.9. Separate Contracts and Cooperation
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SECTION 007213 - GENERAL CONDITIONS

- A. These General Conditions apply to each section of these specifications. The Contractor is subject to the provisions contained herein.
- B. The General Conditions are intended to define the relationship of the Owner, the Designer and the Contractor thereby establishing certain rules and provisions governing the operation and performance of the work so that the work may be performed in a safe, orderly, expeditious and workmanlike manner.

ARTICLE 1 – GENERAL PROVISIONS

ARTICLE 1.1 - DEFINITIONS

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

1. **"COMMISSIONER"**: The Commissioner of the Office of Administration.
2. **"CONSTRUCTION DOCUMENTS"**: The "Construction Documents" shall consist of the Project Manual, Drawings and Addenda.
3. **"CONSTRUCTION REPRESENTATIVE"**: Whenever the term "Construction Representative" is used, it shall mean the Owner's Representative at the work site.
4. **"CONTRACTOR"**: Party or parties who have entered into a contract with the Owner to furnish work under these specifications and drawings.
5. **"DESIGNER"**: When the term "Designer" is used herein, it shall refer to the Architect, Engineer, or Consultant of Record specified and defined in Paragraph 2.0 of the Supplemental Conditions, or his duly authorized representative. The Designer may be either a consultant or state employee.
6. **"DIRECTOR"**: Whenever the term "Director" is used, it shall mean the Director of the Division of Facilities Management, Design and Construction or his Designee, representing the Office of Administration, State of Missouri. The Director is the agent of the Owner.
7. **"DIVISION"**: Shall mean the Division of Facilities Management, Design and Construction, State of Missouri.

8. **"INCIDENTAL JOB BURDENS"**: Shall mean those expenses relating to the cost of work, incurred either in the home office or on the job-site, which are necessary in the course of doing business but are incidental to the job. Such costs include office supplies and equipment, postage, courier services, telephone expenses including long distance, water and ice and other similar expenses.
9. **"JOINT VENTURE"**: An association of two (2) or more businesses to carry out a single business enterprise for profit for which purpose they combine their property, capital, efforts, skills and knowledge.
10. **"OWNER"**: Whenever the term "Owner" is used, it shall mean the State of Missouri, acting by and through the Office of Administration, Division of Facilities Management, Design and Construction.
11. **"PROJECT"**: Wherever the term "Project" is used, it shall mean the work required to be completed by the construction contract.
12. **"PROJECT MANUAL"**: The "Project Manual" shall consist of Introductory Information, Invitation for Bid, Instructions to Bidders, Bid Documents, Additional Information, Standard Forms, General Conditions, Supplemental General Conditions, General Requirements and Technical Specifications.
13. **"SUBCONTRACTOR"**: Party or parties who contract under, or for the performance of part or this entire Contract between the Owner and Contractor. The subcontract may or may not be direct with the Contractor.
14. **"WORK"**: All supervision, labor, materials, tool, supplies, equipment, and any incidental operations and/or activities required by or reasonably inferable from the Contract Documents necessary to construct the Project and 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.
15. **"WORKING DAYS"**: are all calendar days except Saturdays, Sundays and the following holidays: New Year's Day, Martin Luther King, Jr. Day, Lincoln Day, Washington's Birthday (observed), Truman Day, Memorial Day, Juneteenth, Independence Day, Labor Day, Columbus Day, Veterans Day (observed), Thanksgiving Day, Christmas Day.

ARTICLE 1.2 DRAWINGS AND SPECIFICATIONS

- A. In case of discrepancy between drawings and specifications, specifications shall govern. Should discrepancies in architectural drawings, structural drawings and mechanical drawings occur, architectural drawings shall govern and, in case of conflict between structural and mechanical drawings, structural drawings shall govern.
- B. Specifications are separated into titled divisions for convenience of reference only and to facilitate letting of contracts and subcontracts. The Contractor is responsible for establishing the scope of work for subcontractors, which may cross titled divisions. Neither the Owner nor Designer will establish limits and jurisdiction of subcontracts.
- C. Figured dimensions take precedence over scaled measurements and details over smaller scale general drawings. In the event of conflict between any of the documents contained within the contract, the documents shall take precedence and be controlling in the following sequence: addenda, supplementary general conditions, general conditions, division 1 specifications, technical division specifications, drawings, bid form and instructions to bidders.
- D. Anything shown on drawings and not mentioned in these specifications or vice versa, as well as any incidental work which is obviously necessary to complete the project within the limits established by the drawings and specifications, although not shown on or described therein, shall be performed by the Contractor at no additional cost as a part of his contract.
- E. Upon encountering conditions differing materially from those indicated in the contract documents, the Contractor shall promptly notify the Designer and Construction Representative in writing before such conditions are disturbed. The Designer shall promptly investigate said conditions and report to the Owner, with a recommended course of action. If conditions do materially differ and cause an increase or decrease in contract cost or time required for completion of any portion of the work, a contract change will be initiated as outlined in Article 4 of these General Conditions.
- E. Only work included in the contract documents is authorized, and the Contractor shall do no work other than that described therein or in accordance with appropriately authorized and approved contract changes.

ARTICLE 1.3 - COMPLIANCE WITH LAWS, PERMITS, REGULATIONS AND INSPECTIONS

- A. Since the Owner is the State of Missouri, municipal or political subdivisions, zoning ordinances, construction codes (other than licensing of trades), and other like ordinances are not applicable to construction on Owner's property, and Contractor will not be required to submit drawings and specifications to any municipal or political subdivision, authority, obtain construction permits or any other licenses (other than licensing of trades) or permits from or submit to inspections by any municipality or political subdivision relating to the construction for this project. All permits or licenses required by municipality or political subdivision for operation on property not belonging to Owner shall be obtained by and paid for by Contractor. Each Contractor shall comply with all applicable laws, ordinances, rules and regulations that pertain to the work of this contract.
- B. Contractors, subcontractors and their employees engaged in the businesses of electrical, mechanical, plumbing, carpentry, sprinkler system work, and other construction related trades shall be licensed to perform such work by the municipal or political subdivision where the project is located, if such licensure is required by local code. Local codes shall dictate the level (master, journeyman, and apprentice) and the number, type and ratio of licensed tradesmen required for this project within the jurisdiction of such municipal or political subdivision.
- C. Equipment and controls manufacturers and their authorized service and installation technicians that do not maintain an office within the jurisdiction of the municipal or political subdivision but are a listed or specified contractor or subcontractor on this project are exempt from Paragraph 1.3 B above.
- D. The Contractor shall post a copy of the wage determination issued for the project and included as a part of the contract documents, in a prominent and easily accessible location at the site of construction for the duration of the project.
- E. Any contractor or subcontractor to such contractor at any tier signing a contract to work on this project shall provide a ten-hour Occupational Safety and Health Administration (OSHA) construction safety program for their on-site employees which includes a course in construction safety and health approved by OSHA or a similar program approved by the Department of Labor and Industrial Relations which is at least as stringent as an approved OSHA program. The contractor shall

forfeit as a penalty to the public body on whose behalf the contract is made or awarded, two thousand five hundred dollars plus one hundred dollars for each employee employed by the contractor or subcontractor, for each calendar day, or portion thereof, such employee is employed without the required training.

ARTICLE 1.4 - NONDISCRIMINATION IN EMPLOYMENT

A. The Contractor and his subcontractors will not discriminate against individuals based on race, color, religion, national origin, sex, disability, or age, but may use restrictions which relate to bona fide occupational qualifications. Specifically, the Contractor and his subcontractors shall not discriminate:

1. Against recipients of service on the basis of race, color, religion, national origin, sex, disability or age.
2. Against any employee or applicant, for employment on the basis of race, color, religion, national origin, sex or otherwise qualified disability status.
3. Against any applicant for employment or employee on the basis of age, where such applicant or employee is between ages 40 and 70 and where such Contractor employs at least 20 persons.
4. Against any applicant for employment or employee on the basis of that person's status as a disabled or Vietnam-era veteran.

The Contractor and his Subcontractors will take affirmative action to insure applicants for employment and employees are treated equally without regard to race, color, religion, national origin, sex, disability, or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion and transfer; recruitment or recruitment advertising; and selection for training, including apprenticeship. The Contractor and his Subcontractors will give written notice of their commitments under this clause to any labor union with which they have bargaining or other agreements.

B. The Contractor and his subcontractors shall develop, implement, maintain and submit in writing to the Owner 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 included in the contract specifications. For the purpose of this section, an "affirmative action program" means positive action 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 age 40 and 70), disabled and Vietnam-era veteran status, and disability. 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 all collective bargaining agreements; and
5. Performance of an internal audit of the reporting system to monitor execution and to provide for future planning.

In the enforcement of this non-discrimination clause, 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.

C. In the event of the Contractor's or his subcontractor's noncompliance with any provisions of this Article of the Contract, the Owner may cancel this contract in whole or in part or require the Contractor to terminate his contract with the subcontractor.

ARTICLE 1.5 - ANTI-KICKBACK

No employee of the division, shall have or acquire any pecuniary interest, whether direct or indirect, in this contract or in any part hereof. No officer, employee, designer, attorney, or administrator of or for the Owner who is authorized in such capacity and on behalf of the Owner to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the project, shall have or acquire any pecuniary interest, whether direct or indirect, in this contract, any material supply contract, subcontract,

insurance contract, or any other contract pertaining to the project.

ARTICLE 1.6 - PATENTS AND ROYALTIES

- A. The Contractor shall hold and save the Owner and its officers, agents, servants and employees harmless from liabilities of any nature or kind, including cost and expenses, for, or on account of, any patented or unpatented invention, process, article or appliance manufactured or used in the performance of this contract, including its use by the Owner, unless otherwise specifically stipulated in the contract documents.
- B. If the Contractor uses any design, device or materials covered by letters, patent or copyright, the Contractor 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 prices shall include all royalties or costs arising from the use of such design, device or materials, in any way involved in the work. The Contractor and/or his sureties shall indemnify and save harmless the Owner of the project from any and all claims for infringement by reason of the use of such patented or copyrighted design, device or materials 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 obliged to pay by reason of such infringement at any time during the prosecution of the work or after completion of the work.

ARTICLE 1.7 - PREFERENCE FOR AMERICAN AND MISSOURI PRODUCTS AND SERVICES

- A. By virtue of statutory authority a preference will be given to Missouri labor and to products of mines, forests and quarries of the state of Missouri when they are found in marketable quantities in the state, and all such materials shall be of the best quality and suitable character that can be obtained at reasonable market prices, all as provided for in Section 8.280, Missouri Revised Statutes and Cumulative Supplements.
- B. Furthermore, pursuant to Section 34.076 Missouri Revised Statutes and Cumulative Supplements, a preference shall be given to those persons doing business as Missouri firms, corporations, or individuals, or which maintain Missouri offices or places of business, when the quality of performance promised is equal or better and the price quoted is the same or less. In addition, in order for a non-domiciliary bidder to be successful, his bid must be that same percentage lower than a domiciliary Missouri bidder's bid, as would be

required for a Missouri bidder to successfully bid in the non-domiciliary state.

- C. In accordance with the Missouri Domestic Products Procurement Act Section 34.350 RSMo and Cumulative Supplements any manufactured goods or commodities used or supplied in the performance of this contract or any subcontract thereto shall be manufactured, assembled or produced in the United States, unless the specified products are not manufactured, assembled or produced in the United States in sufficient quantities to meet the agency's requirements or cannot be manufactured, assembled or produced in the United States within the necessary time in sufficient quantities to meet the contract requirements, or if obtaining the specified products manufactured, assembled or produced in the United States would increase the cost of this contract for purchase of the product by more than ten percent.

ARTICLE 1.8 - COMMUNICATIONS

- A. All notices, requests, instructions, approvals and claims must be in writing and shall be delivered to the Designer and copied to the Construction Representative for the project except as required by Article 1.12 Disputes and Disagreements, or as otherwise specified by the Owner in writing as stated in Section 012600. Any such notice shall be deemed to have been given as of the time of actual receipt.
- B. The Contractor shall attend on-site progress and coordination meetings, as scheduled by the Construction Representative, no less than once a month.
- C. The Contractor shall ensure that major subcontractors and suppliers shall attend monthly progress meetings as necessary to coordinate the work, and as specifically requested by the Construction Representative.

ARTICLE 1.9 - SEPARATE CONTRACTS AND COOPERATION

- A. The Owner reserves the right to let other contracts in connection with this work. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work and shall properly connect and coordinate his work with theirs.
- B. The Contractor shall consult the drawings for all other contractors in connection with this work. Any work conflicting with the above shall be brought to the attention of the Owner's Representative before the work is performed. If the Contractor fails to do this, and constructs any

work which interferes with the work of another contractor, the Contractor shall remove any part so conflicting and rebuild same, as directed by the Owner's Representative at no additional cost to the Owner.

- C. Each contractor shall be required to coordinate his work with other contractors so as to afford others reasonable opportunity for execution of their work. No contractor shall delay any other contractor by neglecting to perform contract work at the proper time. If any contractor causes delay to another, they shall be liable directly to that contractor for such delay in addition to any liquidated damages which might be due the Owner.
- D. Should the Contractor or project associated subcontractors refuse to cooperate with the instructions and reasonable requests of other Contractors or other subcontractors in the overall coordinating of the work, the Owner may take such appropriate action and issue directions, as required, to avoid unnecessary and unwarranted delays.
- E. Each Contractor shall be responsible for damage done to Owner's or other Contractor's property by him/her or workers in his employ through their fault or negligence.
- F. Should a Contractor sustain any damage through any act or omission of any other Contractor having a contract with the Owner, the Contractor so damaged shall have no claim or cause of action against the Owner for such damage, but shall have a claim or cause of action against the other Contractor to recover any and all damages sustained by reason of the acts or omissions of such Contractor. The phrase "acts or omissions" as used in this section shall be defined to include, but not be limited to, any unreasonable delay on the part of any such contractors.

ARTICLE 1.10 - ASSIGNMENT OF CONTRACT

- A. No assignment by Contractor of any amount or any part of this contract or of the funds to be received there under will be recognized unless such assignment has had the written approval of the Director and the surety has been given due notice of such assignment and has furnished written consent thereto. 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 this contract and to claims or 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 1.11 - INDEMNIFICATION

- A. Contractor agrees to indemnify and save harmless Owner and its respective commissioners, officers, officials, agents, consultants and employees and Designer, their agents, servants and employees, from and against any and all liability for damage arising from injuries to persons or damage to property occasioned by any acts or omissions of Contractor, any subcontractors, agents, servants or employees, including any and all expense, legal or otherwise, which may be incurred by Owner or Designer, its agents, servants or employees, in defense of any claim, action or suit.
- B. The obligations of the Contractor under this paragraph shall not extend to the liability of the Designer, his agents or employees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, contract changes, design or specifications, or (2) giving of or the failure to give directions or instructions by the Designer, his agents or employees as required by this contract documents provided such giving or failure to give is the primary cause of the injury or damage.

ARTICLE 1.12 - DISPUTES AND DISAGREEMENTS

It is hereby expressly agreed and understood that in case any controversy or difference of opinion arises during construction, best efforts will be given to resolution at the field level. Should those efforts be unsuccessful, the Contractor has the right to appeal in writing, the decision of the Director's Designee to the Director at Room 730 Truman Building, P.O. Box 809, Jefferson City, Missouri 65102. The decision of the Director shall be final and binding on all parties.

ARTICLE 2 -- OWNER/DESIGNER RESPONSIBILITIES

- A. The Owner shall give all orders and directions contemplated under this contract relative to the execution of the work. During progress of work the Owner will be represented at the project site by the Construction Representative and/or Designer, whose responsibilities are to see that this contract is properly fulfilled.
- B. The Owner shall at all times have access to the work whenever it is in preparation or progress. The Contractors shall provide proper facilities for such access and for inspection and supervision.
- C. All materials and workmanship used in the work shall be subject to the inspection of the Designer and Construction Representative, and any work which is deemed defective shall be removed, rebuilt or made good immediately upon notice.

The cost of such correction shall be borne by the Contractor. Contractor shall not be entitled to an extension of the contract completion date in order to remedy defective work. All rejected materials shall be immediately removed from the site of the work.

- D. If the Contractor fails to proceed at once with the correction of rejected defective materials or workmanship, the Owner may, by separate contract or otherwise, have the defects remedied or rejected. Materials removed from the site and charge the cost of the same against any monies which may be due the Contractor, without prejudice to any other rights or remedies of the Owner.
- E. Failure or neglect on the part of Owner to observe faulty work, or work done which is not in accordance with the drawings and specifications shall not relieve the Contractor from responsibility for correcting such work without additional compensation.
- F. The Owner shall have the right to direct the Contractor to uncover any completed work.
 - 1. If the Contractor fails to adequately notify the Construction Representative and/or Designer of an inspection as required by the Contract Documents, the Contractor shall, upon written request, uncover the work. The Contractor shall bear all costs associated with uncovering and again covering the work exposed.
 - 2. If the Contractor is directed to uncover work, which was not otherwise required by the Contract Documents to be inspected, and the work is found to be defective in any respect, no compensation shall be allowed for this work. If, however, such work is found to meet the requirements of this contract, the actual cost of labor and material necessarily involved in the examination and replacement plus 10% shall be allowed the Contractor.
- G. The Designer shall give all orders and directions contemplated under this contract relative to the scope of the work and shall give the initial interpretation of the contract documents.
- H. The Owner may file a written notice to the Contractor to dismiss immediately any subcontractors, project managers, superintendents, foremen, workers, watchmen or other employees whom the Owner may deem incompetent, careless or a hindrance to proper or timely execution of the work. The Contractor shall comply with such notice as promptly as practicable without detriment to the work or its progress.

- I. If in the Owner's judgment it becomes necessary at any time to accelerate work, when ordered by the Owner in writing, the Contractor shall redirect resources to such work items and execute such portions of the work as may be required to complete the work within the current approved contract schedule.

ARTICLE 3 -- CONTRACTOR RESPONSIBILITIES

The Contractor shall register and utilize the Owner's eBuilder digital project management system for submission of documents described in the following sections. This includes but is not limited to submittals as required by designer, payment applications, Request for Information (RFI), construction change orders, Request for Proposals (RFP), Designer Supplemental Instructions (DSI), etc.

ARTICLE 3.1 -- ACCEPTABLE SUBSTITUTIONS

- A. The Contractor may request use of any article, device, product, material, fixture, form or type of construction which in the judgment of the Owner and Designer is equal in all respects to that named. 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 and Designer that they are equal in design, strength, durability, usefulness and convenience for the purpose intended.
- B. Any changes required in the details and dimensions indicated on the drawings for the substitution of products other than those specified shall be properly made at the expense of the Contractor requesting the substitution or change.
- C. The Contractor shall submit a request for such substitutions in writing to the Owner and Designer within twenty (20) working days after the date of the "Notice to Proceed." Thereafter no consideration will be given to alternate forms of accomplishing the work. This Article does not preclude the Owner from exercising the provisions of Article 4 hereof.
- D. Any request for substitution by the Contractor shall be submitted in accordance with SECTION 002113 - INSTRUCTIONS TO BIDDERS.
- E. When a material has been approved, no change in brand or make will be permitted unless:
 - 1. Written verification is received from the manufacturer stating they cannot make delivery on the date previously agreed, or
 - 2. Material delivered fails to comply with contract requirements.

ARTICLE 3.2 -- SUBMITTALS

- A. The Contractor’s submittals must be submitted with such promptness as to allow for review and approval so as not to cause delay in the work. The Contractor shall coordinate preparation and processing of submittals with performance of construction activities.

Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

Submit four (4) copies to the Designer and additional copies as required for the subcontractors and material suppliers. Also provide copies to meet the requirements for maintenance manuals.

- B. All subcontractors' shop drawings and schedules shall be submitted by the Contractor and shall bear evidence that Contractor has received, reviewed, and approved them. Any shop drawings and schedules submitted without this evidence will be returned to the Contractor for resubmission.
- C. The Contractor shall include with the shop drawing, a letter indicating any and all deviations from the drawings and/or specifications. Failure to notify the Designer of such deviations will be grounds for subsequent rejection of the related work or materials. If, in the opinion of the Designer, the deviations are not acceptable, the Contractor will be required to furnish the item as specified and indicated on the drawings.
- D. The Designer shall check shop drawings and schedules with reasonable promptness and approve them only if they conform to the design concept of the project and comply with the information given in the contract documents. The approval shall not relieve the Contractor from the responsibility to comply with the drawings and specifications, unless the Contractor has called the Designer's attention to the deviation, in writing, at the time of submission and the Designer has knowingly approved thereof. An approval of any such modification will be given only under the following conditions:
 - 1. It is in the best interest of the Owner
 - 2. It does not increase the contract sum and/or completion time
 - 3. It does not deviate from the design intent
 - 4. It is without prejudice to any and all rights under the surety bond.
- E. No extension of time will be granted because of the Contractor's failure to submit shop drawings and schedules in ample time to allow for review,

possible resubmission, and approval. Fabrication of work shall not commence until the Contractor has received approval. The Contractor shall furnish prints of approved shop drawings and schedules to all subcontractors whose work is in any way related to the work under this contract. Only prints bearing this approval will be allowed on the site of construction

- F. The Contractor shall maintain a complete file on-site of approved shop drawings available for use by the Construction Representative.

ARTICLE 3.3 – AS-BUILT DRAWINGS

- A. The Contractor shall update a complete set of the construction drawings, shop drawings and schedules of all work monthly by marking changes, and at the completion of their work (prior to submission of request for final payment) note all changes and turn the set over to the Construction Representative. The updates shall show all addenda, all field changes that were made to adapt to field conditions, changes resulting from contract changes or supplemental instructions, and all locations of structures, buried installations of piping, conduit, and utility services. All buried and concealed items both inside and outside shall be accurately located as to depth and referenced to permanent features such as interior or exterior wall faces and dimensions shall be given in a neat and legible manner in a contrasting colored pencil or ink. If approved by the Designer, an electronic file format may be provided.

ARTICLE 3.4 – GUARANTY AND WARRANTIES

- A. General Guaranty
 - 1. Neither the final certificate of payment nor any provision in the contract documents nor partial use or occupancy of the premises by the Owner shall constitute an acceptance of work not done in accordance with contract requirements.
 - 2. The Contractor or surety shall remedy any defects in the work and pay for any damage to property resulting there from which shall appear within a period of one (1) year from the date of substantial completion unless a longer period is otherwise specified or a differing guaranty period has been established in the substantial completion certificate. The Owner will give notice of observed defects with reasonable promptness.
 - 3. In case of default on the part of the Contractor in fulfilling this part of this contract, the Owner may correct the work or repair the

damage and the cost and expense incurred in such event shall be paid by or recoverable from the Contractor or surety.

4. The work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Contractor's guaranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by the Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment

B. Extended Warranty

Manufacturer's certificates of warranty shall be obtained for all major equipment. Warranty shall be obtained for at least one year. Where a longer period is offered at no additional cost or called for in the specific equipment specifications, the longer period shall govern.

ARTICLE 3.5 -- OPERATION AND MAINTENANCE MANUALS

- A. Immediately after equipment submittals are approved and no later than ten (10) working days prior to the substantial completion inspection, the Contractor shall provide to the Designer three (3) copies of operating instructions and service manuals, containing the following:

1. Start-up and Shut-down 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 be prepared to include model number, capacities, flow rate, name place data, shop drawings and air and water balance reports.
4. Service Instructions: Provide the following information for all pieces of equipment.

- a. Recommended spare parts including catalog number and name of local supplier or factory representative.
- b. Belt sizes, types, and lengths.
- c. Wiring diagrams.

5. Manufacturer's Certificate of Warranty as described in Article 3.4.

6. Prior to the final payment, furnish to the Designer three (4) copies of parts catalogs for each piece of equipment furnished by him/her on the project with the components identified by number for replacement ordering.

- B. Submission of operating instructions shall be done in the following manner.

1. Manuals shall be in quadruplicate, and all materials shall be bound into volumes of standard 8½" x 11" hard binders. Large drawings too bulky to be folded into 8½" x 11" shall be separately bound or folded and in envelopes, cross referenced and indexed with the manuals.

2. The manuals shall identify project name, project number, and include the name and address of the Contractor, subcontractors and manufacturers who were involved with the activity described in that particular manual.

3. Internally subdivide the binder contents with permanent page dividers, logically organized with tab titles clearly printed under reinforced laminated plastic tabs.

4. Contents: Prepare a Table of Contents for each volume, with each product or system description identified.

ARTICLE 3.6 – OTHER CONTRACTOR RESPONSIBILITIES

- A. The Contractor shall keep on site, during progress of the work, a competent superintendent satisfactory to the Construction Representative. The superintendent shall represent the Contractor and all agreements made by the superintendent shall be binding. The superintendent shall carefully study and compare all drawings, specifications and other instructions and shall promptly notify the Construction Representative and Designer, in writing, any error, inconsistency or omission which may be discovered. The superintendent shall coordinate all work on the project. Any change of the superintendent shall be approved by the Construction Representative.

- B. Contractor shall, at all times, enforce strict discipline and good order among his employees,

and shall not employ on the work any unfit person or anyone not skilled in the work assigned to him/her.

- C. The Contractor shall supply sufficient labor, material, plant and equipment and pay when due any laborer, subcontractor or supplier for supplies furnished and otherwise prosecute the work with diligence to prevent work stoppage and insure completion thereof within the time specified.
- D. The Contractor and each of his subcontractors shall submit to the Construction Representative, through the Designer such schedules of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data as the Owner may request concerning work performed or to be performed under this contract.
- E. The Contractor, subcontractors, and material suppliers shall upon written request, give the Owner access to all time cards, material invoices, payrolls, estimates, profit and loss statements, and all other direct or indirect costs related to this work.
- F. The Contractor shall be responsible for laying out all contract work such as layout of architectural, structural, mechanical and electrical work, which shall be coordinated with layouts of subcontractors for general construction work. The Contractor is also responsible for unloading, uncrating and handling of all materials and equipment to be erected or placed by him/her, whether furnished by Contractor or others. No extra charges or compensation will be allowed as a result of failure to verify dimensions before ordering materials or fabricating items.
- G. The Contractor must notify the Construction Representative at least one working day before placing concrete or burying underground utilities, pipelines, etc.
- H. Contractors shall prearrange time with the Construction Representative for the interruption of any facility operation. Unless otherwise specified in these documents, all connections, alterations or relocations as well as all other portions of the work will be performed during normal working hours.
- I. The Contractor shall coordinate all work so there will not be prolonged interruptions of existing equipment operation. Any existing plumbing, heating, ventilating, air conditioning or electrical disconnections necessary for the project, which affect portions of this construction or building or any other building must be scheduled with the Construction Representative to minimize or avoid any disruption of facility operations. In no case,

unless previously approved in writing by the Construction Representative, shall utilities be left disconnected at the end of a work day or over a weekend. Any interruption of utilities either intentionally or accidentally shall not relieve the Contractor responsible for the interruption from the responsibility to repair and restore the utility to normal service. Repairs and restoration shall be made before the workers responsible for the repair and restoration leave the job.

- J. Contractors shall limit operations and storage of materials to the area within the project, except as necessary to connect to existing utilities, and shall not encroach on neighboring property. The Contractor shall be responsible for repair of their damage to property on or off the project site occurring during construction of project. All such repairs shall be made to the satisfaction of the property owner.
- K. Unless otherwise permitted, all materials shall be new and both workmanship and materials shall be of the best quality.
- L. Unless otherwise provided and stipulated within these specifications, the Contractor shall furnish, construct, and/or install and pay for materials, devices, mechanisms, equipment, all necessary personnel, utilities including, but not limited to water, heat, light and electric power, transportation services, applicable taxes of every nature, and all other facilities necessary for the proper execution and completion of the work.
- M. Contractor shall carefully examine the plans and drawings and shall be responsible for the proper fitting of his material, equipment and apparatus into the building.
- N. The Contractor or subcontractors shall not overload, or permit others to overload, any part of any structure during the performance of this contract.
- O. All temporary shoring, bracing, etc., required for the removal of existing work and/or for the installation of new work shall be included in this contract. The Contractor shall make good, at no cost to the Owner, any damage caused by improper support or failure of shoring in any respect. Each Contractor shall be responsible for shoring required to protect his work or adjacent property and improvements of Owner and shall be responsible for shoring or for giving written notice to adjacent property owners. Shoring shall be removed only after completion of permanent supports.

- P. The Contractor shall provide at the proper time such material as is required for support of the work. If openings are required, whether shown on drawings or not, the Contractor shall see that they are properly constructed.
- Q. During the performance of 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 will give proper and understandable warning to all persons of danger of entry onto land, structure or equipment.
- R. The Contractor shall be responsible for protection, including weather protection, and proper maintenance of all equipment and materials.
- S. The Contractor shall be responsible for care of the finished work and shall protect same from damage or defacement until substantial completion by the Owner. If the work is damaged by any cause, the Contractor shall immediately begin to make repairs in accordance with the drawings and specifications. Contractor shall be liable for all damage or loss unless attributable to the acts or omissions of the Owner or Designer. Any claim for reimbursement shall be submitted in accordance with Article 4. After substantial completion the Contractor will only be responsible for damage resulting from acts or omissions of the Contractor or subcontractors through final warranty.
- T. In the event the Contractor encounters an unforeseen hazardous material, the Contractor shall immediately stop work in the area affected and report the condition to the Owner and Designer in writing. The Contractor shall not be required, pursuant to Article 4, to perform, any work relating to hazardous materials.
- U. In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 4.
- V. Before commencing work, Contractors shall confer with the Construction Representative and facility representative and review any facility rules and regulations which may affect the conduct of the work.
- W. Project signs will only be erected on major projects and only as described in the specifications. If no sign is specified, none shall be erected.

ARTICLE 3.7 -- SUBCONTRACTS

- A. Subcontractor assignments as identified in the bid form shall not be changed without written approval of the Owner. The Owner will not approve changes of a listed subcontractor unless the Contractor documents, to the satisfaction of the Owner that the subcontractor cannot or will not perform the work as specified.
- B. The Contractor is fully responsible to the Owner for the acts and omissions of all subcontractors and of persons either directly or indirectly employed by them.
- C. Every subcontractor shall be bound by the applicable terms and provisions of these contract documents, but no contractual relationship shall exist between any subcontractor and the Owner unless the right of the Contractor to proceed with the work is suspended or this contract is terminated as herein provided, and the Owner in writing elects to assume the subcontract.
- D. The Contractor shall upon receipt of "Notice to Proceed" and prior to submission of the first payment request, notify the Designer and Construction Representative in writing of the names of any subcontractors to be used in addition to those identified in the bid form and all major material suppliers proposed for all parts of the work.

ARTICLE 4 -- CHANGES IN THE WORK

4.1 CHANGES IN THE WORK

- A. The Construction Representative, without giving notice to the surety and without invalidating this contract, may order extra work or make changes by altering, adding to or deducting from the work, this contract sum being adjusted accordingly. All such work shall be executed under the conditions of the original contract. A claim for extension of time caused by any change must be adjusted at the time of ordering such change. No future request for time will be considered.
- B. Each Contract Change shall include all costs required to perform the work including all labor, material, equipment, overheads and profit, delay, disruptions, or other miscellaneous expenses. No subsequent requests for additional compensation including claims for delay, disruption, or reduced efficiency as a result of each change will be considered. Values from the Schedule of Values will not be binding as a basis for additions to or deductions from the contract price.
- C. The amount of any adjustment in this contract price for authorized changes shall be agreed upon

before such changes become effective and shall be determined, through submission of a request for proposal, as follows:

1. By an acceptable fixed price proposal from the Contractor. Breakdowns shall include all takeoff sheets of each Contractor and subcontractor. Breakdown shall include a listing of each item of material with unit prices and number of hours of labor for each task. Labor costs per hour shall be included with labor burden identified, which shall be not less than the prevailing wage rate, etc. Overhead and profit shall be shown separately for each subcontractor and the Contractor.
2. By a cost-plus-fixed-fee (time and material) basis with maximum price, total cost not to exceed said maximum. Breakdown shall include a listing of each item of material with unit prices and number of hours of labor for each task. Labor costs per hour shall be included with labor burden identified, which shall be not less than the prevailing wage rate, etc. Overhead and profit shall be shown separately for each subcontractor and the Contractor.
3. By unit prices contained in Contractor's original bid form and incorporated in the construction contract.

D. Overhead and Profit on Contract Changes shall be applied as follows:

1. The overhead and profit charge by the Contractor and all subcontractors shall be considered to include, but is not limited to: incidental job burdens, small truck (under 1 ton) expense, mileage, small hand tools, warranty costs, company benefits and general office overhead. Project supervision including field supervision and job site office expense shall be considered a part of overhead and profit unless a compensable time extension is granted.
2. The percentages for overhead and profit charged on Contract Changes shall be subject to the following limits: (a) the percentage mark-up for the Contractor shall be limited to the Contractor's fee; (b) fifteen percent (15%) maximum for Work directly performed by employees of a subcontractor, or sub-subcontractor; (c) five percent (5%) maximum for the Work performed or passed through to the Owner by the Contractor; (d) five percent (5%) maximum subcontractor's mark-up for Work performed by a sub-subcontractor and

passed through to the Owner by the subcontractor and Contractor; and (e) in no case shall the total overhead and profit paid by the Owner on any Contract Changes exceed twenty-five percent (25%) of the cost of materials, labor and equipment (exclusive of Contractor or any Subcontractor overhead and profit) necessary to put the contract change work in place.

3. The Contractor will be allowed to add the cost of Contractor's payment and performance bonding, builder's risk insurance, and general liability insurance to their cost of work. The above listed bonding and insurance cost shall not exceed 2% and shall be allowed on the total cost of the added work, including overhead and profit.
 4. On proposals covering both increases and decreases in the amount of this contract, the application of overhead and profit shall be on the net change in the cost of the work.
 5. The percentage(s) for overhead and profit to be credited to the Owner on Contract Changes that are solely decreases in the quantity of work or materials shall be the same as those for additive Contract Changes provided above.
- E. No claim for an addition to this contract sum shall be valid unless authorized as aforesaid in writing by the Owner. In the event that none of the foregoing methods are agreed upon, the Owner may order the Contractor to perform work on a time and material basis. The cost of such work shall be determined by the Contractor's actual labor and material cost to perform the work plus overhead and profit as outlined herein. The Designer and Construction Representative shall approve the Contractor's daily time and material invoices for the work involved.
- F. If the Contractor claims that any instructions involve extra cost under this contract, the Contractor shall give the Owner's Representative written notice thereof within a reasonable time after the receipt of such instructions, and in any event before proceeding to execute the work. No such claim shall be valid unless so made and authorized by the Owner, in writing.
- G. In an emergency affecting the safety of life or of the structure or of adjoining property, the Contractor, without special instruction or authorization from the Construction Representative, is hereby permitted to act at their discretion to prevent such threatened loss or injury. The Contractor shall submit a claim for

compensation for such emergency work in writing to the Owner's Representative.

ARTICLE 4.2 – CHANGES IN COMPLETION TIME

- A. Extension of the number of work days stipulated in the Contract for completion of the work with compensation may be made when:
 - 1. The contractor documents that proposed Changes in the work, as provided in Article 4.1, extends construction activities critical to contract completion date, OR
 - 2. The Owner suspends all work for convenience of the Owner as provided in Article 7.3, OR
 - 3. An Owner caused delay extends construction activities critical to contract completion (except as provided elsewhere in these General Conditions). The Contractor is to review the work activities yet to begin and evaluate the possibility of rescheduling the work to minimize the overall project delay.
- B. Extension of the number of work days stipulated in the Contract for completion of the work without compensation may be made when:
 - 1. Weather-related delays occur, subject to provisions for the inclusion of a specified number of "bad weather" days when provided for in Section 012100-Allowances, OR
 - 2. Labor strikes or acts of God occur, OR
 - 3. The work of the Contractor is delayed on account of conditions which were beyond the control of the Contractor, subcontractors or suppliers, and were not the result of their fault or negligence.
- C. No time extension or compensation will be provided for delays caused by or within the control of the Contractor, subcontractors or suppliers and for concurrent delays caused by the Owner.
- D. The Contractor shall notify the Owner promptly of any occurrence or conditions which in the Contractor's opinion results in a need for an extension of time. The notice shall be in writing and shall include all necessary supporting materials with details of any resultant costs and be submitted in time to permit full investigation and evaluation of the Contractor's claim. The Owner shall promptly acknowledge the Contractor's notice and, after recommendation from the Owner's Representative and/or Designer, shall provide a decision to the Contractor. Failure on the part of the Contractor to provide such notice and to detail the costs shall constitute a waiver by

the Contractor of any claim. Requests for extensions of time shall be for working days only.

ARTICLE 5 - CONSTRUCTION AND COMPLETION

ARTICLE 5.1 – CONSTRUCTION COMMENCEMENT

- A. Upon receipt of the "Intent to Award" letter, the Contractor must submit the following properly executed instruments to the Owner:
 - 1. Contract;
 - 2. Performance/payment bond as described in Article 6.1;
 - 3. Certificates of Insurance, or the actual policies themselves, showing that the Contractor has obtained the insurance coverage required by Article 6.2.
 - 4. Written Affirmative Action Plans as required in Article 1.4.
- Above referenced items must be received by the Owner within ten (10) working days after the effective date of the contract. If not received, the Owner may treat the failure to timely submit them as a refusal by the Contractor to accept a contract for this work and may retain as liquidated damages the Contractor's bid bond, cashier's check or certified check as provided in the Instructions to Bidders. Upon receipt the Owner will issue a "Notice to Proceed" with the work to the Contractor.
- B. Within the time frame noted in Section 013200 - Schedules, following receipt of the "Notice to Proceed", the Contractor shall submit to the Owner a progress schedule and schedule of values, showing activities through the end of the contract period. Should the Contractor not receive written notification from the Owner of the disapproval of the schedule of values within fifteen (15) working days, the Contractor may consider it approved for purpose of determining when the first monthly Application and Certification for Payment may be submitted.
 - C. The Contractor may commence work upon receipt of the Division of Facilities Management, Design and Construction's "Notice to Proceed" letter. Contractor shall prosecute the work with faithfulness and energy, and shall complete the entire work on or before the completion time stated in the contract documents or pay to the Owner the damages resulting from the failure to timely complete the work as set out within Article 5.4.

ARTICLE 5.2 -- PROJECT CONSTRUCTION

- A. Each Contractor shall submit for the Owner's approval, in reproducible form, a progress schedule showing the rate of progress and the order of the work proposed to carry on various phases of the project. The schedule shall be in conformance with the requirements outlined in Section 013200 – Schedules.
- B. Contractor shall employ and supply a sufficient force of workers, material, and equipment and shall pay when due, any worker, subcontractor or supplier and otherwise prosecute the work with such diligence so as to maintain the rate of progress indicated on the progress schedule, prevent work stoppage, and insure completion of the project within the time specified.

ARTICLE 5.3 -- PROJECT COMPLETION

- A. Substantial Completion. A Project is substantially complete when construction is essentially complete and work items remaining to be completed can be done without interfering with the Owner's ability to use the Project for its intended purpose.
 1. Once the Contractor has reached what they believe is Substantial Completion, the Contractor shall notify the Designer and the Construction Representative of the following:
 - a. That work is essentially complete with the exception of certain listed work items. The list shall be referred to as the "Contractor's Punch."
 - b. That all Operation and Maintenance Manuals have been assembled and submitted in accordance with Article 3.5A.
 - c. That the Work is ready for inspection by the Designer and Construction Representative. The Owner shall be entitled to a minimum of ten working days notice before the inspection shall be performed.
 2. If the work is acceptable, the Owner shall issue a Certificate of Substantial Completion, which shall set forth the responsibilities of the Owner and the Contractor for utilities, security, maintenance, damage to the work and risk of loss. The Certificate shall also identify those remaining items of work to be performed by the Contractor. All such work items shall be complete within 30 working days of the date of the Certificate, unless the Certificate specifies a different time. If the

Contractor shall be required to perform tests that must be delayed due to climatic conditions, it is understood that such tests and affected equipment will be identified on the Certificate and shall be accomplished by the Contractor at the earliest possible date. Performance of the tests may not be required before Substantial Completion can be issued. The date of the issuance of the Certificate of Substantial Completion shall determine whether or not the work was completed within the contract time and whether or not Liquidated Damages are due.

3. If the work is not acceptable, and the Owner does not issue a Certificate of Substantial Completion, the Owner shall be entitled to charge the Contractor with the Designer's and Owner's costs of re-inspection, including time and travel.
- B. Partial Occupancy. Contractor agrees that the Owner shall be permitted to occupy and use any completed or partially completed portions of the Project, when such occupancy and use is in the Owner's best interest. Owner shall notify Contractor of its desire and intention to take Partial Occupancy as soon as possible but at least ten (10) working days before the Owner intends to occupy. If the Contractor believes that the portion of the work the Owner intends to occupy is not ready for occupancy, the Contractor shall notify the Owner immediately. The Designer shall inspect the work in accordance with the procedures above. If the Contractor claims increased cost of the project or delay in completion as a result of the occupancy, he shall notify the Owner immediately but in all cases before occupancy occurs.
- C. Final Completion. The Project is finally complete when the Certificate of Substantial Completion has been issued and all work items identified therein as incomplete have been completed, and when all administrative items required by the contract have been completed. Final Completion entitles the Contractor to payment of the outstanding balance of the contract amount including all change orders and retainage. Within five (5) working days of the date of the Certificate of Substantial Completion, the Contractor shall identify the cost to complete any outstanding items of work. The Designer shall review the Contractor's estimate and either approve it or provide an independent estimate for all such items. If the Contractor fails to complete the remaining items within the time specified in the Certificate, the Owner may terminate the contract and go to the surety for project completion in accordance with Article 7.2 or release the contract balance to the Contractor less 150% of the

approved estimate to complete the outstanding items. Upon completion of the outstanding items, when a final cost has been established, any monies remaining shall be paid to the Contractor. Failure to complete items of work does not relieve the Contractor from the obligation to complete the administrative requirements of the contract, such as the provisions of Article 5.3 FAILURE TO COMPLETE ALL ITEMS OF WORK UNDER THE CONTRACT SHALL BE CONSIDERED A DEFAULT AND BE GROUNDS FOR CONTRACT TERMINATION AND DEBARMENT.

- D. Liquidated Damages. Contractor agrees that the Owner may deduct from the contract price and retain as liquidated damages, and not as penalty or forfeiture, the sum stipulated in this contract for each work day after the Contract Completion Day on which work is not Substantially Complete. Assessment of Liquidated Damages shall not relieve the Contractor or the surety of any responsibility or obligation under the Contract. In addition, the Owner may, without prejudice to any other rights, claims, or remedies the Owner may have including the right to Liquidated Damages, charge the Contractor for all additional expenses incurred by the Owner and/or Designer as the result of the extended contract period through Final Completion. Additional Expenses shall include but not be limited to the costs of additional inspections.
- E. Early Completion. The Contractor has the right to finish the work before the contract completion date; however, the Owner assumes no liability for any hindrances to the Contractor unless Owner caused delays result in a time extension to the contract completion date. The Contractor shall not be entitled to any claims for lost efficiencies or for delay if a Certificate of Substantial Completion is given on or before the Contract Completion Date.

ARTICLE 5.4 -- PAYMENT TO CONTRACTOR

- A. Payments on account of this contract will be made monthly in proportion to the work which has been completed. Request for payment must be submitted on the Owner's forms. No other pay request will be processed. Supporting breakdowns must be in the same format as Owner's forms and must provide the same level of detail. The Designer will, within 5 working days from receipt of the contractor's request for payment either issue a Certificate for Payment to the Owner, for such amount as the Designer determines is properly due, or notify the Contractor in writing of reasons for withholding a Certificate. The Owner shall make payment within 30 calendar days after the

"Application and Certification for Payment" has been received and certified by the Designer. The following items are to be attached to the contractor's pay request:

1. Updated construction schedule
 2. Certified payrolls consisting of name, occupation and craft, number of hours worked and actual wages paid for each individual employee, of the Contractor and all subcontractors working on the project
- B. The Owner shall retain 5 percent of the amount of each such payment application, except as allowed by Article 5.4, until final completion and acceptance of all work covered by this contract.
- C. Each payment made to Contractor shall be on account of the total amount payable to Contractor and all material and work covered by paid partial payment shall thereupon become the sole property of Owner. This provision shall not be construed as relieving Contractor from sole responsibility for care and protection of materials and work upon which payments have been made or restoration of any damaged work or as a waiver of the right of Owner to require fulfillment of all terms of this contract.
- D. Materials delivered to the work site and not incorporated in the work will be allowed in the Application and Certification for Payment on the basis of one hundred (100%) percent of value, subject to the 5% retainage providing that they are suitably stored on the site or in an approved warehouse in accordance with the following requirements:
1. Material has previously been approved through submittal and acceptance of shop drawings conforming to requirements of Article 3.2 of General Conditions.
 2. Delivery is made in accordance with the time frame on the approved schedule.
 3. Materials, equipment, etc., are properly stored and protected from damage and deterioration and remain so - if not, previously approved amounts will be deleted from subsequent pay applications.
 4. The payment request is accompanied by a breakdown identifying the material equipment, etc. in sufficient detail to establish quantity and value.
- E. The Contractor shall be allowed to include in the Application and Certification for Payment, one hundred (100%) of the value, subject to retainage,

of major equipment and material stored off the site if all of the following conditions are met:

1. The request for consideration of payment for materials stored off site is made at least 15 working days prior to submittal of the Application for Payment including such material. Only materials inspected will be considered for inclusion on Application for Payment requests.
 2. Materials stored in one location off site are valued in excess of \$25,000.
 3. That a Certificate of Insurance is provided indicating adequate protection from loss, theft conversion or damage for materials stored off site. This Certificate shall show the State of Missouri as an additional insured for this loss.
 4. The materials are stored in a facility approved and inspected, by the Construction Representative.
 5. Contractor shall be responsible for, Owner costs to inspect out of state facilities, and any delays in the completion of the work caused by damage to the material or for any other failure of the Contractor to have access to this material for the execution of the work.
- F. The Owner shall determine the amount, quality and acceptability of the work and materials which are to be paid for under this contract. In the event any questions shall arise between the parties, relative to this contract or specifications, determination or decision of the Owner or the Construction Representative and the Designer shall be a condition precedent to the right of the Contractor to receive any money or payment for work under this contract affected in any manner or to any extent by such question.
- G. Payments Withheld: The Owner may withhold or nullify in whole or part any certificate to such extent as may be necessary to protect the Owner from loss on account of:
1. Defective work not remedied. When a notice of noncompliance is issued on an item or items, corrective action shall be undertaken immediately. Until corrective action is completed, no monies will be paid and no additional time will be allowed for the item or items. The cost of corrective action(s) shall be borne by the Contractor.
 2. A reasonable doubt that this contract can be completed for the unpaid balance.
3. Failure of the Contractor to update as-built drawings monthly for review by the Construction Representative.
 4. Failure of the Contractor to update the construction schedule.
- When the Construction Representative is satisfied the Contractor has remedied above deficiencies, payment shall be released.
- H. Final Payment: Upon receipt of written notice from the Contractor to the Designer and Project Representative that the work is ready for final inspection and acceptance, the Designer and Project Representative, with the Contractor, shall promptly make such inspection. If the work is acceptable and the contract fully performed, the Construction Representative shall complete a final acceptance report and the Contractor will be directed to submit a final Application and Certification for Payment. If the Owner approves the same, the entire balance shall be due and payable, with the exception of deductions as provided for under Article 5.4.
1. Where the specifications provide for the performance by the Contractor of (certain tests for the purpose of balancing and checking the air conditioning and heating equipment and the Contractor shall have furnished and installed all such equipment in accordance with the specifications, but said test cannot then be made because of climatic conditions, such test shall may be considered as required under the provisions of the specifications, Section 013300 and this contract may be substantial Full payment will not be made until the tests have been made and the equipment and system is finally accepted. If the tests are not completed when scheduled, the Owner may deduct 150% of the value of the tests from the final payment.
 2. The final payment shall not become due until the Contractor delivers to the Construction Representative:
 - a) A complete file of releases, on the standard form included in the contract documents as "Final Receipt of Payment and Release Form", from subcontractors and material suppliers evidencing payment in full for services, equipment and materials, as the case may require, if the Owner approves, or a consent from the Surety to final payment accepting liability for any unpaid amounts.

- b) An Affidavit of Compliance with Prevailing Wage Law, in the form as included in this contract specifications, properly executed by each subcontractor, and the Contractor
 - c) Certified copies of all payrolls
 - d) As-built drawings
3. If any claim remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all monies that the latter may be compelled to pay in discharging such a claim including all costs and a reasonable attorney's fee.
 4. Missouri statute requires prompt payment from the Owner to the Contractor within thirty calendar days and from the Contractor to his subcontractors within fifteen calendar days. Failure to make payments within the required time frame entitles the receiving party to charge interest at the rate of one and one half percent per month calculated from the expiration of the statutory time period until paid.
 5. The value of all unused unit price allowances and/or 150% of the value of the outstanding work items, and/or liquidated damages may be deducted from the final pay request without executing a Contract Change. Any unit price items which exceed the number of units in the contract may be added by Contract Change.

ARTICLE 6 -- INSURANCE AND BONDS

ARTICLE 6.1 -- BOND

- A. Contractor shall furnish a performance/payment bond in an amount equal to 100% of the contract price to guarantee faithful performance of the contract and 100% of the contract price to guarantee the payment of all persons performing labor on the project and furnishing materials in connection therewith under this contract as set forth in the standard form of performance and payment bond included in the contract documents. The surety on such bond shall be issued by a surety company authorized by the Missouri Department of Insurance to do business in the state of Missouri.
- B. All Performance/Payment Bonds furnished in response to this provision shall be provided by a bonding company with a rating of B+ or higher as established by A.M. Best Company, Inc. in their most recent publication.

ARTICLE 6.2 – INSURANCE

- A. The successful Contractor shall procure and maintain for the duration of the contract issued a policy or policies of insurance for the protection of both the Contractor and the Owner and their respective officers, officials, agents, consultants and employees. The Owner requires certification of insurance coverage from the Contractor prior to commencing work.
- B. Minimum Scope and Extent of Coverage
 1. General Liability

Commercial General Liability, ISO coverage form number or equivalent CG 00 01 ("occurrence" basis), or I-SO coverage form number CG 00 02, or ISO equivalent.

If ISO equivalent or manuscript general liability coverage forms are used, minimum coverage will be as follows: Premises/Operations; Independent Contractors; Products/Completed Operations; personal Injury; Broad Form Property Damage including Completed Operations; Broad Form Contractual Liability Coverage to include Contractor's obligations under Article 1.11 Indemnification and any other Special Hazards required by the work of the contract.
 2. Automobile Liability

Business Automobile Liability Insurance, ISO Coverage form number or equivalent CA 00 01 covering automobile liability, code 1 "ANY AUTO".
 3. Workers' Compensation and Employer's Liability

Statutory Workers' Compensation Insurance for Missouri and standard Employer's Liability Insurance, or the authorization to self-insure for such liability from the Missouri Division of Workers' Compensation.
 4. Builder's Risk or Installation Floater Insurance

Insurance upon the work and all materials, equipment, supplies, temporary structures and similar items which may be incident to the performance of the work and located at or adjacent to the site, against loss or damage from fire and such other casualties as are included in extended coverage in broad "All Risk" form, including coverage for Flood and Earthquake, in an amount not less than the replacement cost of the work or this contract price, whichever is greater, with loss payable

to Contractor and Owner as their respective interests may appear.

Contractor shall maintain sufficient insurance to cover the full value of the work and materials as the work progresses, and shall furnish Owner copies of all endorsements. If Builder's Risk Reporting- Form of Endorsement is used, Contractor shall make all reports as required therein so as to keep in force an amount of insurance which will equal the replacement cost of the work, materials, equipment, supplies, temporary structures, and other property covered thereby; and if, as a result of Contractor's failure to make any such report, the amount of insurance so recoverable shall be less than such replacement cost, Contractor's interest in the proceeds of such insurance, if any, shall be subordinated to Owner's interest to the end that Owner may receive full reimbursement for its loss.

C. Minimum Limits of Insurance

1. General Liability

Contractor

\$2,000,000 combined single limit per occurrence for bodily injury, personal injury, and property damage

\$2,000,000 annual aggregate

2. Automobile Liability

\$2,000,000 combined single limit per occurrence for bodily injury and property damage

3. Workers' Compensation and Employers Liability

Workers' Compensation limits as required by applicable State Statutes (generally unlimited) and minimum of \$1,000,000 limit per accident for Employer's Liability.

General Liability and Automobile Liability insurance may be arranged under individual policies for the full limits required or by a combination of underlying policies with the balance provided by a form-following Excess or Umbrella Liability policy.

D. Deductibles and Self-Insured Retentions

All deductibles, co-payment clauses, and self-insured retentions must be declared to and approved by the Owner. The Owner reserves the right to request the reduction or elimination of unacceptable deductibles or self-insured retentions,

as they would apply to the Owner, and their respective officers, officials, agents, consultants and employees. Alternatively, the Owner may request Contractor to procure a bond guaranteeing payment of losses and related investigations, claims administration, and defense expenses.

E. Other Insurance Provisions and Requirements

The respective insurance policies and coverage, as specified below, must contain, or be endorsed to contain the following conditions or provisions:

1. General Liability

The Owner, and its respective commissioners, officers, officials, agents, consultants and employees shall be endorsed as additional insured's by ISO form CG 20 26 Additional Insured - Designated Person or Organization. As additional insured's, they shall be covered as to work performed by or on behalf of the Contractor or as to liability which arises out of Contractor's activities or resulting from the performance of services or the delivery of goods called for by the Contract.

Contractor's insurance coverage shall be primary with respect to all additional insured's. Insurance of self-insurance programs maintained by the designated additional -insured's shall be excess of the Contractor's insurance and shall not contribute with it.

Additionally, the Contractor and Contractor's general liability insurer shall agree to waive all rights of subrogation against the Owner and any of their respective officers, officials, agents, consultants or employees for claims, losses, or expenses which arise out of Contractor's activities or result from the performance of services or the delivery of goods called for by the Contract.

Contractor's failure to comply with the terms and conditions of these insurance policies shall not affect or abridge coverage for the Owner, or for any of their officers, officials, agents, consultants or employees.

2. Automobile Insurance

The Owner, and their respective officers, officials, agents, consultants and employees shall be endorsed as additional insured's by ISO form CG 20 26 - Additional Insured Designated Person or Organization. As additional insured's, they shall be covered as to work performed by or on behalf of the Contractor or as to liability which arises out of Contractor's activities or resulting from the

performance of services or the delivery of goods called for by the Contract.

Contractor's insurance coverage shall be primary with respect to all additional insured's. Insurance or self-insurance programs maintained by the designated additional insured's shall be in excess of the Contractor's insurance and shall not contribute with it.

Additionally, the Contractor and Contractor's automobile insurer shall agree to waive all rights of subrogation against the Owner and any of their respective officers, officials, agents, consultants or employees for claims, losses, or expenses which arise out of Contractor's activities or result from the performance of services or the delivery of goods called for by the Contract.

Contractor's failure to comply with the terms and conditions of these insurance policies shall not affect or abridge coverage for the Owner or for any of its officers, officials, agents, consultants or employees.

3. Workers' Compensation/Employer's Liability

Contractor's workers' compensation insurance shall be endorsed with NCCI form WC 00 03 01 A - Alternative Employer Endorsement. The Alternative Employer Endorsement shall designate the Owner as "alternate employers."

4. All Coverages

Each insurance policy required by this section of the Contract shall contain a stipulation, endorsed if necessary, that the Owner will receive a minimum of a thirty (30) calendar day advance notice of any policy cancellation. Ten (10) calendar days advance notice is required for policy cancellation due to non-payment of premium.

F. Insurer Qualifications and Acceptability

Insurance required hereunder shall be issued by an A.M. Best, "B+" rated, Class IX insurance company approved to conduct insurance business in the state of Missouri.

G. Verification of Insurance Coverage

Prior to Owner issuing a Notice to Proceed, the Contractor shall furnish the Owner with Certificate(s) of Insurance and with any applicable original endorsements evidencing the required insurance coverage. The insurance certificates and endorsements are to be signed by a person authorized by that insurer to bind coverage on its

behalf. All certificates and endorsements received by the Owner are subject to review and approval by the Owner. The Owner reserves the right to require certified copies of all required policies at any time. If the scope of this contract will exceed one (1) year - or, if any of Contractor's applicable insurance coverage expires prior to completion of the work or services required under this contract - the Contractor will provide a renewal or replacement certificate before continuing work or services hereunder. If the Contractor fails to provide documentation of required insurance coverage, the Owner may issue a stop work order and no additional contract completion time and/or compensation shall be granted as a result thereof.

ARTICLE 7 – SUSPENSION OR TERMINATION OF CONTRACT

ARTICLE 7.1 - FOR SITE CONDITIONS

When conditions at the site of the proposed work are considered by the Owner to be unsatisfactory for prosecution of the work, the Contractor may be ordered in writing to suspend the work or any part thereof until reasonable conditions exist. When such suspension is not due to fault or negligence of the Contractor, time allowed for completion of such suspended work will be extended by a period of time equal to that lost due to delay occasioned by ordered suspension. This will be a no cost time extension.

ARTICLE 7.2 - FOR CAUSE

A. Termination or Suspension for Cause:

1. If the Contractor shall file for bankruptcy, or should make a general assignment for the benefit of the creditors, or if a receiver should be appointed on account of insolvency, or if the contractor should persistently or repeatedly refuse or fail to supply enough properly skilled workers or proper materials, or if the contractor should fail to make prompt payment to subcontractors or for material or labor, or persistently disregard laws, ordinances or the instructions of the Owner, or otherwise be guilty of a substantial violation of any provision of this contract, then the Owner may serve notice on the Contractor and the surety setting forth the violations and demanding compliance with this contract. Unless within ten (10) consecutive calendar days after serving such notice, such violations shall cease and satisfactory arrangements for correction be made, the Owner may suspend the Contractor's right to proceed with the work or terminate this contract.

2. In the event the Owner suspends Contractor's right to proceed with the work or terminates the contract, the Owner may demand that the Contractor's surety take over and complete the work on this contract, after the surety submits a written proposal to the Owner and receives written approval and upon the surety's failure or refusal to do so within ten (10) consecutive calendar days after demand therefore, the Owner may take over the work and prosecute the same to completion by bid or negotiated contract, or the Owner may elect to take possession of and utilize in completing the work such materials, supplies, appliances and plant as may be on the site of the work, and all subcontractors, if the Owner elects, shall be bound to perform their contracts.
- B. The Contractor and its surety shall be and remain liable to the Owner for any excess cost or damages occasioned to the Owner as a result of the actions above set forth.
- C. The Contractor in the event of such suspension or termination shall not be entitled to receive any further payments under this contract until the work is wholly finished. Then if the unpaid balance under this contract shall exceed all expenses of the Owner as certified by the Director, such excess shall be paid to the Contractor; but, if such expenses shall exceed the unpaid balance as certified by the Director, the Contractor and their surety shall be liable for and shall pay the difference and any damages to the Owner.
- D. In exercising Owner's right to secure completion of the work under any of the provisions hereof, the Director shall have the right to exercise Owner's sole discretion as to the manner, methods and reasonableness of costs of completing the work.
- E. The rights of the Owner to suspend or terminate as herein provided shall be cumulative and not exclusive and shall be in addition to any other remedy provided by law.
- F. The Contractor in the event of such suspension or termination may be declared ineligible for Owner contracts for a minimal period of twelve (12) months. Further, no contract will be awarded to any Contractor who lists in their bid form any subcontractor whose prior performance has contributed, as determined by the Owner, to a breach of a contract. In order to be considered for state-awarded contracts after this period, the Contractor/subcontractor will be required to forward acceptance reports to the Owner regarding successful completion of non-state projects during the intervening twelve (12) months from the date

of default. No contracts will be awarded to a subcontractor/Contractor until the ability to perform responsibly in the private sector has been proven to the Owner.

ARTICLE 7.3 -- FOR CONVENIENCE

- A. The Owner may terminate or suspend the Contract or any portion of the Work without cause at any time, and at the Owner's convenience. Notification of a termination or suspension shall be in writing and shall be given to the Contractor and their surety. If the Contract is suspended, the notice will contain the anticipated duration of the suspension or the conditions under which work will be permitted to resume. If appropriate, the Contractor will be requested to demobilize and re-mobilize and will be reimbursed time and costs associated with the suspension.
- B. Upon receipt of notification, the Contractor shall:
 1. Cease operations when directed.
 2. Take actions to protect the work and any stored materials.
 3. Place no further subcontracts or orders for material, supplies, services or facilities except as may be necessary to complete the portion of the Contract that has not been terminated. No claim for payment of materials or supplies ordered after the termination date shall be considered.
 4. Terminate all existing subcontracts, rentals, material, and equipment orders.
 5. Settle all outstanding liabilities arising from termination with subcontractors and suppliers.
 6. Transfer title and deliver to the Owner, work in progress, completed work, supplies and other material produced or acquire for the work terminated, and completed or partially completed plans, drawings information and other property that, if the Contract had been completed, would be required to be furnished to the Owner.
- C. For termination without cause and at the Owner's convenience, in addition to payment for work completed prior to date of termination, the Contractor may be entitled to payment of other documented costs directly associated with the early termination of the contract. Payment for anticipated profit and unapplied overhead will not be allowed.

SECTION 007300 - SUPPLEMENTARY CONDITIONS

1.0 GENERAL:

A. These Supplementary General Conditions clarify, add, delete, or otherwise modify standard terms and conditions of DIVISION 0, BIDDING AND CONTRACTING REQUIREMENTS.

2.0 CONTACTS:

Designer: Elliott Reed
Cochran
530A East Independence Drive
Union, MO 63084
Telephone: (636) 584-0540
Email: ereed@cochraneng.com

Construction Representative: Michael Howard
Division of Facilities Management, Design and Construction
119 Olympic Way
St. Pters, MO 63376
Telephone: (636) 524-8503
Email: Mike.Howard@oa.mo.gov

Project Manager: Ryan Abbott
Division of Facilities Management, Design and Construction
301 West High Street, Room 730
Jefferson City, Missouri 65101
Telephone: (573) 298-1967
Email: Ryan.Abbott@oa.mo.gov

Contract Specialist: Mandy Roberson
Division of Facilities Management, Design and Construction
301 West High Street, Room 730
Jefferson City, Missouri 65101
Telephone: 573-522-0074
Email: mandy.roberson@oa.mo.gov

3.0 NOTICE: ALL BID MATERIALS ARE DUE AT THE TIME OF BID SUBMITTAL. THERE IS NO SECOND SUBMITTAL FOR THIS PROJECT.

4.0 FURNISHING CONSTRUCTION DOCUMENTS:

- A. The Owner will furnish the Contractor with approximately 4 complete sets of drawings and specifications at no charge.
- B. The Owner will furnish the Contractor with approximately 4 sets of explanatory or change drawings at no charge.
- C. The Contractor may make copies of the documents as needed with no additional cost to the Owner.

5.0 SAFETY REQUIREMENTS

Contractor and subcontractors at any tier shall comply with RSMo 292.675 and Article 1.3, E, of Section 007213, General Conditions.

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Missouri

Division of Labor Standards

WAGE AND HOUR SECTION



MICHAEL L. PARSON, Governor

Annual Wage Order No. 30

Section 100
ST. LOUIS COUNTY

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

Original Signed by _____

Todd Smith, Director
Division of Labor Standards

Filed With Secretary of State: _____ **March 10, 2023**

Last Date Objections May Be Filed: **April 10, 2023**

Prepared by Missouri Department of Labor and Industrial Relations

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Asbestos Worker	\$66.97
Boilermaker	\$41.15*
Bricklayer	\$62.54
Carpenter	\$61.56
Lather	
Linoleum Layer	
Millwright	
Pile Driver	
Cement Mason	\$58.25
Plasterer	
Communications Technician	\$62.85
Electrician (Inside Wireman)	\$73.29
Electrician Outside Lineman	\$58.76
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Elevator Constructor	\$96.60
Glazier	\$65.67
Ironworker	\$67.11
Laborer	\$52.47
General Laborer	
First Semi-Skilled	
Second Semi-Skilled	
Mason	\$50.74
Marble Mason	
Marble Finisher	
Terrazzo Worker	
Terrazzo Finisher	
Tile Setter	
Tile Finisher	
Operating Engineer	\$67.06
Group I	
Group II	
Group III	
Group III-A	
Group IV	
Group V	
Painter	\$51.81
Plumber	\$75.30
Pipe Fitter	
Roofer	\$56.75
Sheet Metal Worker	\$72.05
Sprinkler Fitter	\$78.94
Truck Driver	\$41.15*
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

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

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

Heavy Construction Rates for
ST. LOUIS County

Section 100

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Carpenter	\$62.80
Millwright	
Pile Driver	
Electrician (Outside Lineman)	\$58.76
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Laborer	\$53.14
General Laborer	
Skilled Laborer	
Operating Engineer	\$67.79
Group I	
Group II	
Group III	
Group IV	
Truck Driver	\$46.49
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

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

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

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

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

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

OVERTIME and HOLIDAYS

OVERTIME

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

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

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

HOLIDAYS

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

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

SECTION 011000 – SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Project consists of the improvement of campsites (sites 1-33). The construction will include electrical upgrades to 50 amp service and sewer and water hook ups for each campsite. Two sanitary sewer extensions will be required for service to the site. The upgrade of host campsite 34 is included as Alternate #1.
 - 1. Project Location: Dr. Edmund Babler State Park, 800 Guy Park Drive, Wildwood, MO 63005.
 - 2. Owner: State of Missouri, Office of Administration, Division of Facilities Management, Design and Construction, Harry S Truman State Office Building, Post Office Box 809, 301 West High Street, Jefferson City, Missouri 65102.
- B. Contract Documents, dated **September 13, 2023** were prepared for the Project by Cochran – 530A East Independence Drive, Union, MO 63084.
- C. The Work consists of concrete paving for the campsites, gravity sanitary sewer, water service lines, and electrical services.
 - 1. The Work includes:
 - a. Providing new concrete pads for each campsite including standard amenities such as picnic tables, lantern posts and fire rings
 - b. Providing a 50-amp electrical service for each campsite
 - c. Providing a water service connection for each campsite
 - d. Providing a sanitary sewer connection for each campsite
 - e. Providing two sanitary sewer mains to provide service to the campgrounds
- D. The Work will be constructed under a single prime contract.

1.3 WORK SEQUENCE

- A. The Work will be conducted in one phase.

1.4 CONTRACTOR USE OF PREMISES

- A. General: During the construction period the Contractor shall have full use of the premises for construction operations, including use of the site. The Contractor's use of the premises limited only by the Owner's right to perform work or to retain other contractors on portions of the Project.
- B. Use of the Site: Limit use of the premises to work in areas indicated. Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.
 - 1. Owner Occupancy: Allow for Owner occupancy and use by the public.

entrances serving the premises clear and available to the Owner, the Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

1.5 OWNER-FURNISHED PRODUCTS

- A. The Owner will furnish the metal picnic tables, fire rings, and lantern posts. The Contractor will install these items. The Contractor will remove, save, and replace the existing wheel stops at the campsites. The Work includes providing support systems to receive Owner's equipment, and mechanical and electrical connections.
1. The Owner will arrange for and deliver necessary shop drawings, product data, and samples to the Contractor.
 2. The Owner will arrange and pay for delivery of Owner-furnished items according to the contractor's Construction Schedule.
 3. The Contractor is responsible for receiving, unloading and handling Owner furnished items at the site.
 4. Following delivery, the Contractor will inspect items delivered for damage. The Contractor shall not accept damaged items and shall notify the Owner of rejection of damaged items.
 5. If Owner-furnished items are damaged, defective, or missing, the Owner will arrange for replacement.
 6. The Owner will arrange for manufacturer's field services and for the delivery of manufacturer's warranties to the appropriate Contractor.
 7. The Contractor shall designate delivery dates of Owner-furnished items in the Contractor's Construction Schedule.
 8. The Contractor shall review shop drawings, product data and samples and return them to the Designer noting discrepancies or problems anticipated in use of the project.
 9. The Contractor is responsible for protecting Owner-furnished items from damage, including damage from exposure to the elements. The Contractor shall repair or replace items damaged as a result of his operations.

1.6 MISCELLANEOUS PROVISIONS

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 SCHEDULE OF PRODUCTS ORDERED IN ADVANCE

END OF SECTION 011000

SECTION 012100 – ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements governing allowances.
 - 1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.
- B. Types of allowances include the following:
 - 1. Lump-sum allowances.
 - 2. Weather allowances.
- C. Related Sections include the following:
 - 1. Division 1 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders for allowances.
 - 2. Division 1 Section "Unit Prices" for procedures for using unit prices.

1.3 WEATHER ALLOWANCE

- A. Included within the completion period for this project are a specified number of “bad weather” days (see Schedule of Allowances).
- B. The Contractor’s progress schedule shall clearly indicate the bad weather day allowance as an “activity” or “activities”. In the event weather conditions preclude performance of critical work activities for 50% or more of the Contractor’s scheduled workday, that day shall be declared unavailable for work due to weather (a “bad weather” day) and charged against the above allowance. Critical work activities will be determined by review of the Contractor’s current progress schedule.
- C. The Contractor’s Representative and the Construction Representative shall agree monthly on the number of “bad weather” days to be charged against the allowance. This determination will be documented in writing and be signed by the Contractor and the Construction Representatives. If there is a failure to agree on all or part of the “bad weather” days for a particular month, that disagreement shall be noted on this written document and signed by each party’s representative. Failure of the Contractor’s representative to sign the “bad weather” day documentation after it is presented, with or without the notes of disagreement, shall constitute agreement with the “bad weather” day determination contained in that document.
- D. There will be no modification to the time of contract performance due solely to the failure to deplete the “bad weather” day allowance.

- E. Once this allowance is depleted, a no cost Change Order time extension will be executed for “bad weather” days, as defined above, encountered during the remainder of the Project.

1.4 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, Designer of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Designer's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Designer from the designated supplier.

1.5 SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.
- B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.6 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.7 [LUMP-SUM] ALLOWANCES

- A. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials under allowance shall be included as part of the Contract Sum and not part of the allowance.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

- A. Weather Allowance: Included within the completion period for this Project is 14 “bad weather” days.

END OF SECTION 012100

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SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements governing Alternates.

1.3 DEFINITIONS

- A. Definition: An alternate is an amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to the Base Bid amount if the Owner decides to accept a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. The cost for each alternate is the net addition to the Contract Sum to incorporate the Alternate into the Work. No other adjustments are made to the Contract Sum.
- B. No additional time will be allowed for alternate work unless the number of work days is so stated on the bid form.

1.4 PROCEDURES

- A. Coordination: Modify or adjust affected adjacent Work as necessary to completely and fully integrate the Alternate Work into the Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not mentioned as part of the Alternate.
- B. Notification: The award of the Contract will indicate whether alternates have been accepted or rejected.
- C. Execute accepted alternates under the same conditions as other Work of this Contract.
- D. Schedule: A "Schedule of Alternates" is included at the end of this Section. Specification Sections referenced in the Schedule contain requirements for materials necessary to achieve the Work described under each alternate.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. Alternate No. 1: Provide all site improvements and utility connections for host campsite 34.

END OF SECTION 012300

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SECTION 012600 – CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract Modifications.
- B. Related Sections include the following:
 - 1. Division 1, Section 012100 "Allowances" for procedural requirements for handling and processing Allowances.
 - 2. Division 1, Section 013115 "Project Management Communications" for administrative requirements for communications.
 - 3. Division 0, Section 007213, Article 3.1 "Acceptable Substitutions" for administrative procedures for handling Requests for Substitutions made after Contract award.
 - 4. Division 0, Section 007213, Article 4.0 "Changes in the Work" for Change Order requirements.

1.3 REQUESTS FOR INFORMATION

- A. In the event that the Contractor or Subcontractor, at any tier, determines that some portion of the Drawings, Specifications, or other Contract Documents requires clarification or interpretation, the Contractor shall submit a "Request for Information" (RFI) in writing to the Designer. A RFI may only be submitted by the Contractor and shall only be submitted on the RFI forms provided by the Owner. The Contractor shall clearly and concisely set forth the issue for which clarification or interpretation is sought and why a response is needed. In the RFI, the Contractor shall set forth an interpretation or understanding of the requirement along with reasons why such an understanding was reached.
- B. Responses to RFI shall be issued within ten (10) working days of receipt of the Request from the Contractor unless the Designer determines that a longer time is necessary to provide an adequate response. If a longer time is determined necessary by the Designer, the Designer will, within five (5) working days of receipt of the request, notify the Contractor of the anticipated response time. If the Contractor submits a RFI on a time sensitive activity on the current project schedule, the Contractor shall not be entitled to any time extension due to the time it takes the Designer to respond to the request provided that the Designer responds within the ten (10) working days set forth above.
- C. Responses from the Designer will not change any requirement of the Contract Documents. In the event the Contractor believes that a response to a RFI will cause a change to the requirements of the Contract Document, the Contractor shall give written

notice to the Designer requesting a Change Order for the work. Failure to give such written notice within ten (10) working days, shall waive the Contractor's right to seek additional time or cost under Article 4, "Changes in the Work" of the General Conditions.

1.4 MINOR CHANGES IN THE WORK

- A. Designer will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Amount or the Contract Time, on "Designer's Supplemental Instructions" (DSI).

1.5 PROPOSAL REQUESTS

- A. The Designer or Owner Representative will issue a detailed description of proposed Changes in the Work that may require adjustment to the Contract Amount or the Contract Time. The proposed Change Description will be issued using the "Request for Proposal" (RFP) form. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Proposal Requests issued by the Designer or Owner Representative are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
 - 2. Within ten (10) working days after receipt of Proposal Request, submit a proposal for the cost adjustments to the Contract Amount and the Contract Time necessary to execute the Change. The Contractor shall submit his proposal on the appropriate Change Order Detailed Breakdown form. Subcontractors may use the appropriate Change Order Detailed Breakdown form or submit their proposal on their letterhead provided the same level of detail is included. All proposals shall include:
 - a. A detailed breakdown of costs per Article 4.1 of the General Conditions.
 - b. If requesting additional time per Article 4.2 of the General Conditions, include an updated Contractor's Construction Schedule that indicates the effect of the Change including, but not limited to, changes in activity duration, start and finish times, and activity relationship.

1.6 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Proposal Request, the Designer or Owner Representative will issue a Change Order for signatures of Owner and Contractor on the "Change Order" form.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 013100 – COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Projects including, but not limited to, the following:
 - 1. Coordination Drawings.
 - 2. Administrative and supervisory personnel.
 - 3. Project meetings.
- B. Each Contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific Contractor.
- C. Related Sections include the following:
 - 1. Division 1, Section 013200 "Schedules" for preparing and submitting Contractor's Construction Schedule.
 - 2. Articles 1.8.B and 1.8.C of Section 007213 "General Conditions" for coordinating meetings onsite.
 - 3. Article 5.4.H of Section 007213 "General Conditions" for coordinating Closeout of the Contract.

1.3 COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections, which depend on each other for proper installation, connection, and operation.
- B. Coordination: Each Contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each Contractor shall coordinate its operations with operations included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components with other Contractors to ensure maximum accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
 - 4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required

maintenance, service, and repair of all components including mechanical and electrical.

- C. Prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for Owner and separate Contractors if coordination of their Work is required.
- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other Contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's Construction Schedule.
 - 2. Preparation of the Schedule of Values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. Preinstallation conferences.
 - 7. Startup and adjustment of systems.
 - 8. Project Closeout activities.
- E. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
 - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

1.4 SUBMITTALS

- A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.
- B. Key Personnel Names: Within fifteen (15) work days of starting construction operations, submit a list of key personnel assignments including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
 - 1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.5 PROJECT MEETINGS

- A. The Owner's Construction Representative will schedule a Pre-Construction Meeting prior to beginning of construction. The date, time, and exact place of this meeting will be determined after Contract Award and notification of all interested parties. The

Contractor shall arrange to have the Job Superintendent and all prime Subcontractors present at the meeting. During the Pre-Construction Meeting, the construction procedures and information necessary for submitting payment requests will be discussed and materials distributed along with any other pertinent information.

1. Minutes: Designer will record and distribute meeting minutes.
- B. Progress Meetings: The Owner's Construction Representative will conduct Monthly Progress Meetings as stated in Articles 1.8.B and 1.8.C of Section 007213 "General Conditions".
1. Minutes: Designer will record and distribute to Contractor the meeting minutes.
- C. Preinstallation Conferences: Contractor shall conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
1. Attendees: Installer and representatives of Manufacturers and Fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Designer and Construction Representative of scheduled meeting dates.
 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration including requirements for the following:
 - a. Contract Documents
 - b. Options
 - c. Related RFIs
 - d. Related Change Orders
 - e. Purchases
 - f. Deliveries
 - g. Submittals
 - h. Review of mockups
 - i. Possible conflicts
 - j. Compatibility problems
 - k. Time schedules
 - l. Weather limitations
 - m. Manufacturer's written recommendations
 - n. Warranty requirements
 - o. Compatibility of materials
 - p. Acceptability of substrates
 - q. Temporary facilities and controls
 - r. Space and access limitations
 - s. Regulations of authorities having jurisdiction
 - t. Testing and inspecting requirements

- u. Installation procedures
 - v. Coordination with other Work
 - w. Required performance results
 - x. Protection of adjacent Work
 - y. Protection of construction and personnel
3. Contractor shall record significant conference discussions, agreements, and disagreements including required corrective measures and actions.
 4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
 6. Revise paragraph below if Project requires holding progress meetings at different intervals. Insert special intervals such as "every third Tuesday" to suit special circumstances.
 7. Project name
 8. Name and address of Contractor
 9. Name and address of Designer
 10. RFI number including RFIs that were dropped and not submitted
 11. RFI description
 12. Date the RFI was submitted
 13. Date Designer's response was received
 14. Identification of related DSI or Proposal Request, as appropriate

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013115 - PROJECT MANAGEMENT COMMUNICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions, Bid Form, and other Division 1 Specification Sections apply to this Section.
- B. Division 1, Section 013300 - Submittals
- C. Division 1, Section 012600 – Contract Modification Procedures

1.2 SUMMARY

- A. Project Management Communications: The Contractor shall use the Internet web based project management communications tool, E-Builder[®] ASP software, and protocols included in that software during this project. The use of project management communications as herein described does not replace or change any contractual responsibilities of the participants.
 - 1. Project management communications is available through E-Builder[®] as provided by "e-Builder[®]" in the form and manner required by the Owner.
 - 2. The project communications database is on-line and fully functional. User registration, electronic and computer equipment, and Internet connections are the responsibility of each project participant. The sharing of user accounts is prohibited
- B. Support: E-Builder[®] will provide on-going support through on-line help files.
- C. Copyrights and Ownership: Nothing in this specification or the subsequent communications supersedes the parties' obligations and rights for copyright or document ownership as established by the Contract Documents. The use of CAD files, processes or design information distributed in this system is intended only for the project specified herein.
- D. Purpose: The intent of using E-Builder[®] is to improve project work efforts by promoting timely initial communications and responses. Secondly, to reduce the number of paper documents while providing improved record keeping by creation of electronic document files
- E. Authorized Users: Access to the web site will be by individuals who are authorized users.
 - 1. Individuals shall complete the E-Builder New Company/User Request Form located at the following web site: <https://oa.mo.gov/facilities/vendor-links/contractor-forms>.

Completed forms shall be emailed to the following email address: OA.FMDCE-BuilderSupport@oa.mo.gov.

2. Authorized users will be contacted directly and assigned a temporary user password.
 3. Individuals shall be responsible for the proper use of their passwords and access to data as agents of the company in which they are employed.
- F. Administrative Users: Administrative users have access and control of user licenses and all posted items. **DO NOT POST PRIVATE OR YOUR COMPANY CONFIDENTIAL ITEMS IN THE DATABASE!** Improper or abusive language toward any party or repeated posting of items intended to deceive or disrupt the work of the project will not be tolerated and will result in deletion of the offensive items and revocation of user license at the sole discretion of the Administrative User(s).
- G. Communications: The use of fax, email and courier communication for this project is discouraged in favor of using E-Builder® to send messages. Communication functions are as follows:
1. Document Integrity and Revisions:
 - a. Documents, comments, drawings and other records posted to the system shall remain for the project record. The authorship time and date shall be recorded for each document submitted to the system. Submitting a new document or record with a unique ID, authorship, and time stamp shall be the method used to make modifications or corrections.
 - b. The system shall make it easy to identify revised or superseded documents and their predecessors.
 - c. Server or Client side software enhancements during the life of the project shall not alter or restrict the content of data published by the system. System upgrades shall not affect access to older documents or software.
 2. Document Security:
 - a. The system shall provide a method for communication of documents. Documents shall allow security group assignment to respect the contractual parties communication except for Administrative Users. **DO NOT POST PRIVATE OR YOUR COMPANY CONFIDENTIAL ITEMS IN THE DATABASE!**
 3. Document Integration:
 - a. Documents of various types shall be logically related to one another and discoverable. For example, requests for information, daily field reports, supplemental sketches and photographs shall be capable of reference as related records.
 4. Reporting:
 - a. The system shall be capable of generating reports for work in progress, and logs for each document type. Summary reports generated by the system shall be available for team members.
 5. Notifications and Distribution:
 - a. Document distribution to project members shall be accomplished both within the extranet system and via email as appropriate. Project document distribution to parties outside of the project communication system shall be

accomplished by secure email of outgoing documents and attachments, readable by a standard email client.

6. Required Document Types:
 - a. RFI, Request for Information.
 - b. Submittals, including record numbering by drawing and specification section.
 - c. Transmittals, including record of documents and materials delivered in hard copy.
 - d. Meeting Minutes.
 - e. Application for Payments (Draft or Pencil).
 - f. Review Comments.
 - g. Field Reports.
 - h. Construction Photographs.
 - i. Drawings.
 - j. Supplemental Sketches.
 - k. Schedules.
 - l. Specifications.
 - m. Request for Proposals
 - n. Designer's Supplemental Instructions
 - o. Punch Lists

H. Record Keeping: Except for paper documents, which require original signatures and large format documents (greater than 8½ x 11 inches), all other 8½ x 11 inches documents shall be submitted by transmission in electronic form to the E-Builder® web site by licensed users.

- a. The Owner and his representatives, the Designer and his consultants, and the Contractor and his Sub Contractors and suppliers at every tier shall respond to documents received in electronic form on the web site, and consider them as if received in paper document form.
- b. The Owner and his representatives, the Designer and his consultants, and the Contractor and his Sub Contractors and suppliers at every tier reserves the right to and shall reply or respond by transmissions in electronic form on the web site to documents actually received in paper document form.
- c. The Owner and his representatives, the Designer and his consultants, and the Contractor and his Sub Contractors and suppliers at every tier reserves the right to and shall copy any paper document into electronic form and make same available on the web site.

I. Minimum Equipment and Internet Connection: In addition to other requirements specified in this Section, the Owner and his representatives, the Construction Manager and his representatives, the Architect and his consultants, and the Contractor and his sub-contractors and suppliers at every tier required to have a user license(s) shall be responsible for the following:

1. Providing suitable computer systems for each licensed user at the users normal work location¹ with high-speed Internet access, i.e. DSL, local cable company's Internet connection, or T1 connection.
2. Each of the above referenced computer systems shall have the following minimum system² and software requirements:
 - a. Desktop configuration (Laptop configurations are similar and should be equal to or exceed desktop system.)
 - 1) Operating System: Windows XP or newer
 - 2) Internet Browser: Internet Explorer 6.01SP2+ (Recommend IE7.0+)
 - 3) Minimum Recommend Connection Speed: 256K or above
 - 4) Processor Speed: 1 Gigahertz and above
 - 5) RAM: 512 mb
 - 6) Operating system and software shall be properly licensed.
 - 7) Internet Explorer version 7 (current version is a free distribution for download). This specification is not intended to restrict the host server or client computers provided that industry standard HTTP clients may access the published content.
 - 8) Adobe Acrobat Reader (current version is a free distribution for download).
 - 9) Users should have the standard Microsoft Office Suite (current version must be purchased) or the equivalent.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable.)

END OF SECTION 013115

¹ The normal work location is the place where the user is assigned for more than one-half of his time working on this project.

² The minimum system herein will not be sufficient for many tasks and may not be able to process all documents and files stored in the E-Builder® Documents area.

SECTION 013200 – SCHEDULE – BAR CHART

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes requirements for a Bar Chart Schedule for the project construction activities, schedule of submittals, and schedule for testing.

PART 2 - PRODUCTS – (Not Applicable)

PART 3 - EXECUTION

3.1 SUBMITTAL PROCEDURES

- A. The Contractor shall submit to the Designer, within ten (10) working days following the Notice to Proceed, a Progress Schedule including Schedule of Values showing the rate of progress the Contractor agrees to maintain and the order in which he proposed to carry out the various phases of Work. No payments shall be made to the Contractor until the Progress Schedule has been approved by the Owner.
 - 1. The Schedule of Values must have the following line items included with the value of the item as indicated below:
 - a. O&M's (Owner's Manual)
 - 1) \$1,000,000.00 (One million) and under – 2% of the total contract amount
 - 2) Over \$1,000,000.00 (One million) – 1% of the total contract amount
 - b. Close Out Documents
 - 1) \$1,000,000.00 (One million) and under – 2% of the total contract amount
 - 2) Over \$1,000,000.00 (One million) – 1% of the total contract amount
 - c. General Conditions
 - 1) No more than 10%
- B. The Contractor shall submit an updated Schedule for presentation at each Monthly Progress Meeting. The Schedule shall be updated by the Contractor as necessary to reflect the current Schedule and its relationship to the original Schedule. The updated Schedule shall reflect any changes in the logic, sequence, durations, or completion date. Payments to the Contractor shall be suspended if the Progress Schedule is not adequately updated to reflect actual conditions.

- C. The Contractor shall submit Progress Schedules to Subcontractors to permit coordinating their Progress Schedules to the general construction Work. The Contractor shall coordinate preparation and processing of Schedules and reports with performance of other construction activities.

3.2 CONSTRUCTION PROGRESS SCHEDULE – BAR CHART SCHEDULE

- A. Bar-Chart Schedule: The Contractor shall prepare a comprehensive, fully developed, horizontal bar chart-type Contractor's Construction Schedule. The Contractor for general construction shall prepare the Construction Schedule for the entire Project. The Schedule shall show the percentage of work to be completed at any time, anticipated monthly payments by Owner, as well as significant dates (such as completion of excavation, concrete foundation work, underground lines, superstructure, rough-ins, enclosure, hanging of fixtures, etc.) which shall serve as check points to determine compliance with the approved Schedule. The Schedule shall also include an activity for the number of "bad" weather days specified in Section 012100 – Allowances.
 - 1. The Contractor shall provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week.
 - a. If practical, use the same Schedule of Values breakdown for schedule time bars.
 - 2. The Contractor shall provide a base activity time bar showing duration for each construction activity. Each bar is to indicate start and completion dates for the activity. The Contractor is to place a contrasting bar below each original schedule activity time for indicating actual progress and planned remaining duration for the activity.
 - 3. The Contractor shall prepare the Schedule on a minimal number of separate sheets to readily show the data for the entire construction period.
 - 4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on schedule with other construction activities. Include minor elements involved in the overall sequence of the Work. Show each activity in proper sequence. Indicate graphically the sequences necessary for completion of related portions of the Work.
 - 5. Coordinate the Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittal Schedule, progress reports, payment requests, and other required schedules and reports.
 - 6. Indicate the Intent to Award and the Contract Substantial Completion dates on the schedule.
- B. Phasing: Provide notations on the schedule to show how the sequence of the Work is affected by the following:
 - 1. Requirement for Phased completion
 - 2. Work by separate Contractors
 - 3. Work by the Owner
 - 4. Pre-purchased materials
 - 5. Coordination with existing construction
 - 6. Limitations of continued occupancies

7. Un-interruptible services
 8. Partial Occupancy prior to Substantial Completion
 9. Site restrictions
 10. Provisions for future construction
 11. Seasonal variations
 12. Environmental control
- C. Work Stages: Use crosshatched bars to indicate important stages of construction for each major portion of the Work. Such stages include, but are not necessarily limited to, the following:
1. Subcontract awards
 2. Submittals
 3. Purchases
 4. Mockups
 5. Fabrication
 6. Sample testing
 7. Deliveries
 8. Installation
 9. Testing
 10. Adjusting
 11. Curing
 12. Startup and placement into final use and operation
- D. Area Separations: Provide a separate time bar 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. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
 - a. Structural completion.
 - b. Permanent space enclosure
 - c. Completion of mechanical installation
 - d. Completion of the electrical portion of the Work
 - e. Substantial Completion

3.3 SCHEDULE OF SUBMITTALS

- A. Upon acceptance of the Construction Progress Schedule, prepare and submit a complete schedule of submittals. Coordinate the submittal schedule with Section 013300 SUBMITTALS, the approved Construction Progress Schedule, list of subcontracts, Schedule of Values and the list of products.
- B. Prepare the schedule in chronological order. Provide the following information

1. Scheduled date for the first submittal
 2. Related Section number
 3. Submittal category
 4. Name of the Subcontractor
 5. Description of the part of the Work covered
 6. Scheduled date for resubmittal
 7. Scheduled date for the Designer's final release or approval
- C. Distribution: Following the Designer's response to the initial submittal schedule, print and distribute copies to the Designer, Owner, subcontractors, and other parties required to comply with submittal dates indicated.
1. Post copies in the Project meeting room and temporary field office.
 2. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned part of the Work and are no longer involved in construction activities.
- D. Schedule Updating: Revise the schedule after each meeting or other activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

3.4 SCHEDULE OF INSPECTIONS AND TESTS

- A. Prepare a schedule of inspections, tests, and similar services required by the Contract Documents. Submit the schedule with (15) days of the date established for commencement of the Contract Work. The Contractor is to notify the testing agency at least (5) working days in advance of the required tests unless otherwise specified.
- B. Form: This schedule shall be in tabular form and shall include, but not be limited to, the following:
1. Specification Section number
 2. Description of the test
 3. Identification of applicable standards
 4. Identification of test methods
 5. Number of tests required
 6. Time schedule or time span for tests
 7. Entity responsible for performing tests
 8. Requirements for taking samples
 9. Unique characteristics of each service
- C. Distribution: Distribute the schedule to the Owner, Architect, and each party involved in performance of portions of the Work where inspections and tests are required.

END OF SECTION 013200

SECTION 013300 – SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions, Bid Form, and other Division 1 Specification Sections apply to this Section.
- B. Division 1, Section 013115 “Project Management Communications” for administrative requirements for communications.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for submittals required for performance of the Work including the following:
 - 1. Shop Drawings
 - 2. Product Data
 - 3. Samples
 - 4. Quality Assurance Submittals
 - 5. Construction Photographs
 - 6. Operating and Maintenance Manuals
 - 7. Warranties
- B. Administrative Submittals: Refer to General and Supplementary Conditions other applicable Division 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following:
 - 1. Construction Progress Schedule including Schedule of Values
 - 2. Performance and Payment Bonds
 - 3. Insurance Certificates
 - 4. Applications for Payment
 - 5. Certified Payroll Reports
 - 6. Partial and Final Receipt of Payment and Release Forms
 - 7. Affidavit – Compliance with Prevailing Wage Law
 - 8. Record Drawings
 - 9. Notifications, Permits, etc.
- C. The Contractor is obliged and responsible to check all shop drawings and schedules to assure compliance with contract plans and specifications. The Contractor is responsible for the content of the shop drawings and coordination with other contract work. Shop drawings and schedules shall indicate, in detail, all parts of an Item or Work including erection and setting instructions and integration with the Work of other trades.
- D. The Contractor shall at all times make a copy, of all approved submittals, available on site to the Construction Representative.

1.3 SUBMITTAL PROCEDURES

- A. The Contractor shall comply with the General and Supplementary Conditions and other applicable sections of the Contract Documents. The Contractor shall submit, with such promptness as to cause no delay in his work or in that of any other contractors, all required submittals indicated in Part 3.1 of this section and elsewhere in the Contract Documents. Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
 - a. The Designer reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.

- B. Each drawing and/or series of drawings submitted must be accompanied by a letter of transmittal giving a list of the titles and numbers of the drawings. Each series shall be numbered consecutively for ready reference and each drawing shall be marked with the following information:
 - 1. Date of Submission
 - 2. Name of Project
 - 3. Location
 - 4. Section Number of Specification
 - 5. State Project Number
 - 6. Name of Submitting Contractor
 - 7. Name of Subcontractor
 - 8. Indicate if Item is submitted as specified or as a substitution

1.4 SHOP DRAWINGS

- A. Comply with the General Conditions, Article 3.2.

- B. The Contractor shall submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.

- C. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates, and similar drawings including the following information:
 - 1. Dimensions
 - 2. Identification of products and materials included by sheet and detail number
 - 3. Compliance with specified standards
 - 4. Notation of coordination requirements

5. Notation of dimensions established by field measurement
6. Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8½"x11" but no larger than 36"x48".

1.5 PRODUCT DATA

- A. The Contractor shall comply with the General Conditions, Article 3.2.
- B. The Contractor shall collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information, such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves.
 1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products that are not required, mark copies to indicate the applicable information including the following information:
 - a. Manufacturer's printed recommendations
 - b. Compliance with Trade Association standards
 - c. Compliance with recognized Testing Agency standards
 - d. Application of Testing Agency labels and seals
 - e. Notation of dimensions verified by field measurement
 - f. Notation of coordination requirements
 2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

1.6 SAMPLES

- A. The Contractor shall comply with the General Conditions, Article 3.2.
- B. The Contractor shall submit full-size, fully fabricated samples, cured and finished as specified, and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern.
 1. The Contractor shall mount or display samples in the manner to facilitate review of qualities indicated. Prepare samples to match the Designer's sample including the following:
 - a. Specification Section number and reference
 - b. Generic description of the Sample
 - c. Sample source
 - d. Product name or name of the Manufacturer
 - e. Compliance with recognized standards
 - f. Availability and delivery time
 2. The Contractor shall submit samples for review of size, kind, color, pattern, and texture. Submit samples for a final check of these characteristics with other elements and a comparison of these characteristics between the final submittal and the actual component as delivered and installed.

- a. Where variation in color, pattern, texture, or other characteristic is inherent in the material or product represented, submit at least three (3) multiple units that show approximate limits of the variations.
 - b. Refer to other Specification Sections for requirements for samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.
 - c. Refer to other Sections for samples to be returned to the Contractor for incorporation in the Work. Such samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of sample submittals.
 - d. Samples not incorporated into the Work, or otherwise designated as the Owner's property, are the property of the Contractor and shall be removed from the site prior to Substantial Completion.
3. Field samples are full-size examples erected onsite to illustrate finishes, coatings, or finish materials and to establish the Project standard.
- a. The Contractor shall comply with submittal requirements to the fullest extent possible. The Contractor shall process transmittal forms to provide a record of activity.

1.7 QUALITY ASSURANCE DOCUMENTS

- A. The Contractor shall comply with the General Conditions, Article 3.2
- B. The Contractor shall submit quality control submittals including design data, certifications, manufacturer's instructions, manufacturer's field reports, and other quality-control submittals as required under other Sections of the Specifications.
- C. Certifications: Where other Sections of the Specifications require certification that a product, material, or installation complies with specified requirements, submit a notarized certification from the Manufacturer certifying compliance with specified requirements.
 1. Signature: Certification shall be signed by an officer of the Manufacturer or other individual authorized to contractually bind the Company.
- D. Inspection and Test Reports: The Contractor shall submit the required inspection and test reports from independent testing agencies as specified in this Section and in other Sections of the Contract Documents.
- E. Construction Photographs: The Contractor shall submit record construction photographs as specified in this Section and in other Sections of the Contract Documents.
 1. The Contractor shall submit digital photographs. The Construction Administrator shall determine the quantity and naming convention at the preconstruction meeting.
 2. The Contractor shall identify each photograph with project name, location, number, date, time, and orientation.
 3. The Contractor shall submit progress photographs monthly unless specified otherwise. Photographs shall be taken one (1) week prior to submitting.
 4. The Contractor shall take four (4) site photographs from differing directions and a minimum of five (5) interior photographs indicating the relative progress of the Work.

1.8 OPERATING AND MAINTENANCE MANUALS AND WARRANTIES

- A. The Contractor shall submit all required manufacturer's operating instructions, maintenance/service manuals, and warranties in accordance with the General Conditions, Article 3.5, and Supplementary Conditions along with this and other Sections of the Contract Documents.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 REQUIRED SUBMITTALS

- A. Contractor shall submit the following information for materials and equipment to be provided under this contract.

SPEC SECTION	TITLE	CATEGORY
013200	Schedules	Construction Schedule
013200	Schedules	Schedule of Values
013200	Schedules	List of Subcontractors
013200	Schedules	Major Material Suppliers
015713	Temporary Erosion Control	Product Data
260720	Electrical Supports	Product Data
260750	Electrical Identification	Product Data
261200	Conductors and Cables	Product Data
261300	Raceways and Boxes	Product Data
264410	Switchboards	Product Data
264420	Panelboards	Product Data
312000	Earthwork	Test Report
321200	Aggregate Base Course	Product Data
321200	Aggregate Base Course	Test Report
321216	Asphalt Pavement Section	Product Data
321216	Asphalt Pavement Section	Test Report
321313	Portland Cement Concrete	Product Data
321313	Portland Cement Concrete	Test Report
321350	Curbs & Sidewalks	Product Data
321350	Curbs & Sidewalks	Test Report
321723	Pavement Markings	Product Data
329200	Finish Grading & Seeding	Product Data
331000	Water System	Shop Drawings
331000	Water System	Product Data
331000	Water System	Test Report
333000	Sanitary Sewer	Shop Drawings
333000	Sanitary Sewer	Product Data
333000	Sanitary Sewer	Test Report
334000	Storm Drainage	Shop Drawings
334000	Storm Drainage	Product Data

END OF SECTION 013300

SECTION 013513.31 – SITE SECURITY AND HEALTH REQUIREMENTS (DNR)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUBMITTALS

- A. List of required submittals:
 - 1. Materials Safety Data Sheets for all hazardous materials to be brought onsite.
 - 2. Schedule of proposed shutdowns, if applicable.
 - 3. A list of the names of all employees who will submit fingerprints for a background check, and the signed privacy documents identified below for each employee.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 ACCESS TO THE SITE

- A. The Contractor shall arrange with Facility Representatives to establish procedures for the controlled entry of workers and materials into the work areas at the Facility.
- B. The Contractor shall establish regular working hours with Facility Representatives. The Contractor must report changes in working hours or overtime to Facility Representatives and obtain approval twenty-four (24) hours ahead of time. The Contractor shall report emergency overtime to Facility Representatives as soon as it is evident that overtime is needed. The Contractor must obtain approval from Facility Representatives for all work performed after dark.
- C. The Contractor shall provide the name and phone number of the Contractor's employee or agent who is in charge onsite; this individual must be able to be contacted in case of emergency. The Contractor must be able to furnish names and address of all employees upon request.

3.2 FIRE PROTECTION, SAFETY, AND HEALTH CONTROLS

- A. The Contractor shall take all necessary precautions to guard against and eliminate possible fire hazards.
 - 1. Onsite burning is prohibited.
 - 2. The Contractor shall store all flammable or hazardous materials in proper containers located outside the buildings or offsite, if possible.
 - 3. The Contractor shall provide and maintain, in good order, during construction fire extinguishers as required by the National Fire Protection Association. In areas of

flammable liquids, asphalt, or electrical hazards, 15-pound carbon dioxide or 20-pound dry chemical extinguishers shall be provided.

- B. The Contractor shall not obstruct streets or walks without permission from the Owner's Construction Representative and Facility Representatives.
- C. The Contractor's personnel shall not exceed the speed limit of 15 mph while at the Facility unless otherwise posted.
- D. The Contractor shall take all necessary, reasonable measures to reduce air and water pollution by any material or equipment used during construction. The Contractor shall keep volatile wastes in covered containers, and shall not dispose of volatile wastes or oils in storm or sanitary drains.
- E. The Contractor shall keep the project site neat, orderly, and in a safe condition at all times. The Contractor shall immediately remove all hazardous waste, and shall not allow rubbish to accumulate. The Contractor shall provide onsite containers for collection of rubbish and shall dispose of it at frequent intervals during the progress of the Work. The Contractor shall maintain the grass height to less than 8 inches inside of the construction fencing during construction.
- F. Fire exits, alarm systems, and sprinkler systems shall remain fully operational at all times, unless written approval is received from the Owner's Construction Representative and the appropriate Facility Representative at least twenty-four (24) hours in advance. The Contractor shall submit a written time schedule for any proposed shutdowns.
- G. For all hazardous materials brought onsite, Material Safety Data Sheets shall be on site and readily available upon request at least a day before delivery.
- H. Alcoholic beverages or illegal substances shall not be brought upon the Facility premises. The Contractor's workers shall not be under the influence of any intoxicating substances while on the Facility premises.

3.3 DISRUPTION OF UTILITIES

- A. The Contractor shall give a minimum of seventy-two (72) hours written notice to the Construction Representative and the Facility Representative before disconnecting electric, gas, water, fire protection, or sewer service to any building.
- B. The Contractor shall give a minimum of seventy-two (72) hours written notice to the Construction Representative and Facility Representative before closing any access drives, and shall make temporary access available, if possible. The Contractor shall not obstruct streets, walks, or parking.

END OF SECTION 013513.31

SECTION 015000 – CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes requirements for construction facilities and temporary controls including temporary utilities, support facilities, security, and protection.
- B. Temporary utilities include, but are not limited to, the following:
 - 1. Water service and distribution
 - 2. Temporary electric power and light
 - 3. Temporary heat
 - 4. Ventilation
 - 5. Telephone service
 - 6. Sanitary facilities, including drinking water
 - 7. Storm and sanitary sewer
- C. Support facilities include, but are not limited to, the following:
 - 1. Field offices and storage sheds
 - 2. Temporary roads and paving
 - 3. Dewatering facilities and drains
 - 4. Temporary enclosures
 - 5. Hoists and temporary elevator use
 - 6. Temporary project identification signs and bulletin boards
 - 7. Waste disposal services
 - 8. Rodent and pest control
 - 9. Construction aids and miscellaneous services and facilities
- D. Security and protection facilities include, but are not limited to, the following:
 - 1. Temporary fire protection
 - 2. Barricades, warning signs, and lights
 - 3. Sidewalk bridge or enclosure fence for the site
 - 4. Environmental protection

1.3 SUBMITTALS

- A. Temporary Utilities: Submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.

- B. Implementation and Termination Schedule: Within (15) days of the date established for commencement of the Work, submit a schedule indicating implementation and termination of each temporary utility.

1.4 QUALITY ASSURANCE

- A. Regulations: Comply with industry standards and applicable laws and regulations including, but not limited to, the following:
 - 1. Building code requirements
 - 2. Health and safety regulations
 - 3. Utility company regulations
 - 4. Police, fire department, and rescue squad rules
 - 5. Environmental protection regulations
- B. Standards: Comply with NFPA 241 “Standard for Safeguarding Construction, Alterations, and Demolition Operations”. ANSI A10 Series standards for “Safety Requirements for Construction and Demolition”, and NECA Electrical Design Library “Temporary Electrical Facilities”.
 - 1. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70 “National Electric Code”.
- C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.5 PROJECT CONDITIONS

- A. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of permanent service.
- B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the Work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire-prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist onsite.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide new materials. If acceptable to the Designer, the Contractor may use undamaged, previously used materials in serviceable condition. Provide materials suitable for use intended.
- B. Lumber and Plywood: Comply with requirements in Division 6 Section “Rough Carpentry”.
 - 1. For job-built temporary office, shops, and sheds within the construction area, provide UL-labeled, fire-treated lumber and plywood for framing, sheathing, and siding.

2. For signs and directory boards, provide exterior-type, Grade B-B high-density concrete form overlay plywood of sized and thicknesses indicated.
 3. For fences and vision barriers, provide minimum 3/9" (9.5mm) thick exterior plywood.
 4. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8" (16mm) thick exterior plywood.
- C. Gypsum Wallboard: Provide gypsum wallboard on interior walls of temporary offices.
- D. Roofing Materials: Provide UL Class A standard-weight asphalt shingles or UL Class C mineral-surfaced roll roofing on roofs of job-built temporary office, shops, and shed.
- E. Paint: Comply with requirements of Division 9 Section "Painting".
1. For job-built temporary offices, shops, sheds, fences, and other exposed lumber and plywood, provide exterior-grade acrylic-latex emulsion over exterior primer.
 2. For sign panels and applying graphics, provide exterior-grade alkyd gloss enamel over exterior primer.
 3. For interior walls of temporary offices, provide two (2) quarts interior latex-flat wall paint.
- F. Tarpaulins: Provide waterproof, fire-resistant, UL-labeled tarpaulins with flame-spread rating of (15) or less. For temporary enclosures, provide translucent, nylon-reinforced laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.
- G. Water: Provide potable water approved by local health authorities.
- H. Open-Mesh Fencing: Provide 0.120" (3mm) thick, galvanized 2" (50mm) chainlink fabric fencing 6' (2m) high with galvanized steel pipe posts, 1½" (38mm) ID for line posts and 2½" (64mm) ID for corner posts.
- I. Temporary Fencing: Provide 4' tall orange fencing around the dripline of all trees that are to remain.

2.2 EQUIPMENT

- A. General: Provide new equipment. If acceptable to the Designer, the Contractor may use undamaged, previously used equipment in serviceable condition. Provide equipment suitable for use intended.
- B. Water Hoses: Provide ¾" (19mm), heavy-duty, abrasion-resistant, flexible rubber hoses 100' (30m) long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.
- C. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110 to 120V plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.
- D. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage rating.

- E. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered-glass enclosures where exposed to breakage. Provide exterior fixture where exposed to moisture.
- F. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM, or another recognized trade association related to the type of fuel being consumed.
- G. Temporary Offices: Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows, and serviceable finishes. Provide heated and air-conditioned units on foundations adequate for normal loading.
- H. Temporary Toilet Units: Provide self-contained, single-occupant toilet units of the chemical, aerated re-circulation, or combustion type. Provide units properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
- I. Fire Extinguishers: Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers, or a combination of extinguishers of NFPA-recommended classes for the exposures.
 - 1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. Provide each Facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Engage the appropriate local utility company to install temporary service or connect to existing service. Where company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with company recommendations.
 - 1. Arrange with company and existing users for a time when service can be interrupted, if necessary, to make connections for temporary services.
 - 2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.
 - 3. Obtain easements to bring temporary utilities to the site where the Owner's easements cannot be used for that purpose.
 - 4. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Designer. Neither the Owner nor Designer will accept cost or use charges as a basis of claims for Change Order.

- B. Temporary Water Service: Install water service and distribution piping of sizes and pressures adequate for construction until permanent water service is in use.
 - 1. Sterilization: Sterilize temporary water piping prior to use.
- C. Temporary Water Service: The Owner will provide water for construction purposes from the existing building system. All required temporary extensions shall be provided and removed by the Contractor. Connection points and methods of connection shall be designated and approved by the Construction Representative.
- D. Temporary Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload-protected disconnects, automatic ground-fault interrupters, and main distribution switch gear.
 - 1. Install electric power service underground, except where overhead service must be used.
 - 2. Power Distribution System: Install wiring overhead and rise vertically where least exposed to damage. Where permitted, wiring circuits not exceeding 125V, AC 20ampere rating, and lighting circuits may be nonmetallic sheathed cable where overhead and exposed for surveillance.
- E. Temporary Electric Power Service: The Owner will provide electric power for construction lighting and power tools. Contractors using such services shall pay all costs of temporary services, circuits, outlet, extensions, etc.
- F. Temporary Lighting: When overhead floor or roof deck has been installed, provide temporary lighting with local switching.
 - 1. Install and operate temporary lighting that will fulfill security and protection requirements without operating the entire system. Provide temporary lighting that will provide adequate illumination for construction operations and traffic conditions.
- G. Temporary Heating: Provide temporary heat required by construction activities for curing or drying of completed installations or for protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.
 - 1. Heating Facilities: Except where the Owner authorizes use of the permanent system, provide vented, self-contained, LP gas or fuel-oil heaters with individual space thermostatic control.
 - 2. Use of gasoline-burning space heaters, open flame, or salamander heating units is prohibited.
- H. Temporary Heating and Cooling: The normal heating and/or cooling system of the building shall be maintained in operation during the construction. Should the Contractor find it necessary to interrupt the normal HVAC service to spaces, which have not been vacated for construction, such interruptions shall be pre-scheduled with the Construction Representative.
- I. Temporary Telephones: Provide temporary telephone service throughout the construction period for all personnel engaged in construction activities.

1. Telephone Lines: Provide telephone lines for the following:
 - a. Where an office has more than two (2) occupants, install a telephone for each additional occupant or pair of occupants.
 - b. Provide a dedicated telephone for a fax machine in the field office.
 - c. Provide a separate line for the Owner's use.
 2. At each telephone, post a list of important telephone numbers.
- J. Temporary Telephones: The Owner will provide telephones within the facility. All construction personnel will be allowed access only to those specific telephones designated by the Construction Representative.
- K. Temporary Toilets: Install self-contained toilet units. Use of pit-type privies will not be permitted. Comply with regulations and health codes for the type, number, location, operation, and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.
1. Shield toilets to ensure privacy.
 2. Provide separate facilities for male and female personnel.
 3. Provide toilet tissue materials for each facility.
- L. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a health and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.
1. Provide paper towels or similar disposable materials for each facility.
 2. Provide covered waste containers for used material.
 3. Provide safety showers, eyewash fountains, and similar facilities for convenience, safety, and sanitation of personnel.
- M. Drinking-Water Facilities: Provide containerized, tap-dispenser, bottled-water drinking-water units, including paper supply.
1. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45°F to 55°F (7°C to 13°C).

- N. Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rains.

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Locate field offices, storage sheds, and other temporary construction and support facilities for easy access.
 - 1. Maintain support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.
- B. Field Offices: Provide insulated, weathertight temporary offices of sufficient size to accommodate required office personnel at the Project site. Keep the office clean and orderly for use for small progress meetings. Furnish and equip office as follows:
 - 1. Furnish with a desk and chairs, a 4-drawer file cabinet, plan table, plan rack, and a 6-shelf bookcase.
 - 2. Equip with a water cooler and private toilet complete with water closet, lavatory, and medicine cabinet unit with a mirror.
- C. Storage facilities: Install storage sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters or fully enclosed spaces within the building or elsewhere onsite.
- D. Storage Facilities: The Owner will provide storage onsite as designated by the Facility Representative or the Construction Representative. Areas for use by the Contractor for storage will be identified at the Pre-Bid Meeting.

- G. Temporary Paving: Construct and maintain temporary roads and paving to support the indicated loading adequately and to withstand exposure to traffic during the construction period. Locate temporary paving for roads, storage areas, and parking where the same permanent facilities will be located. Review proposed modifications to permanent paving with the Designer.
1. Paving: Comply with Division 2 Section "Hot-Mixed Asphalt Paving" for construction and maintenance of temporary paving.
 2. Coordinate temporary paving development with subgrade grading, compaction, installation and stabilization of subbase, and installation of base and finish courses of permanent paving.
 3. Install temporary paving to minimize the need to rework the installations and to result in permanent roads and paved areas without damage or deterioration when occupied by the Owner.
 4. Delay installation of the final course of permanent asphalt concrete paving until immediately before Substantial Completion. Coordinate with weather conditions to avoid unsatisfactory results.
 5. Extend temporary paving in and around the construction area as necessary to accommodate delivery and storage of materials, equipment usage, administration, and supervision.
- H. Construction Parking: Parking at the site will be provided in the areas designated at the Pre-Construction Meeting.
- I. Construction Parking: Contractors must be prepared to discuss their storage and parking needs at the Pre-Bid Meeting. Parking for construction personnel cannot be provided onsite. All parking will be offsite. The Contractor will have to park on the street, in city-owned lots, or in commercial lots. Under no circumstances will any vehicle be parked in a fire lane. Parking on lawns shall be prohibited.
- J. Dewatering Facilities and Drains: For temporary drainage and dewatering facilities and operations not directly associated with construction activities included under individual Sections, comply with dewatering requirements of applicable Division 2 Sections. Where feasible, utilize the same facilities. Maintain the site, excavations, and construction free of water.
- K. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities.
1. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and materials drying or curing requirements to avoid dangerous conditions and effects.
 2. Install tarpaulins securely with incombustible wood framing and other materials. Close openings of 25SqFt (2.3SqM) or less with plywood or similar materials.
 3. Close openings through floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.
 4. Where temporary wood or plywood enclosure exceeds 100SqFt (9.2SqM) in area, use UL-labeled, fire-retardant-treated material for framing and main sheathing.

- L. Temporary Lifts and Hoists: Provide facilities for hoisting materials and employees. Truck cranes and similar devices used for hoisting materials are considered “tools and equipment” and not temporary facilities.
- M. Project Identification and Temporary Signs: Prepare project identification and other signs of size indicated. Install signs where indicated to inform the public and persons seeking entrance to the Project. Support on posts or framing of preservative-treated wood or steel. Do not permit installation of unauthorized signs.
 - 1. Project Identification Signs: Engage an experienced sign painter to apply graphics. Comply with details indicated.
 - 2. Temporary Signs: Prepare signs to provide directional information to construction personnel and visitors.
- N. Temporary Exterior Lighting: Install exterior yard and sign lights so signs are visible when Work is being performed.
- O. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than seven (7) days during normal weather or three (3) days when the temperature is expected to rise above 80°F (27°C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material lawfully.
- P. Rodent Pest Control: Before deep foundation work has been completed, retain a local exterminator or pest control company to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests. Employ this service to perform extermination and control procedures are regular intervals so the Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.
- Q. Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate. Cover finished, permanent stairs with a protective covering of plywood or similar material so finishes will be undamaged at the time of acceptance.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer, as requested by the Designer.
- B. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of the types needed to protect against reasonable predictable and controllable fire losses. Comply with NFPA 10 “Standard for Portable Fire Extinguishers” and NFPA 241 “Standard for Safeguarding Construction, Alterations, and Demolition Operations”.

1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one (1) extinguisher on each floor at or near each usable stairwell.
 2. Store combustible materials in containers in fire-safe locations.
 3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for fighting fires. Prohibit smoking in hazardous fire-exposure areas.
 4. Provide supervision of welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
- C. Permanent Fire Protection: At the earliest feasible date in each area of the Project complete installation of the permanent fire-protection facility including connected services and place into operation and use. Instruct key personnel on use of facilities.
- D. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting including flashing red or amber lights.
- E. Enclosure Fence: Before excavation begins, install an enclosure fence with lockable entrance gates. Locate where indicated, or enclose the entire site or the portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs, and other animals from easily entering the site, except by the entrance gates.
1. Provide open-mesh, chainlink fencing with posts set in a compacted mixture of gravel and earth.
 2. Provide plywood fence, 8' (2.5m) high, framed with (4) 2"x4" (50mm x 100mm) rails, and preservative-treated wood posts spaced not more than 8' (2.5m) apart.
- F. Covered Walkway: Erect a structurally adequate, protective covered walkway for passage of persons along the adjacent public street. Coordinate with entrance gates, other facilities, and obstructions. Comply with regulations of authorities having jurisdiction.
1. Construct covered walkways using scaffold or shoring framing. Provide wood plank overhead decking, protective plywood enclosure walls, handrails, barricades, warning signs, lights, safe and well-drained walkways, and similar provisions for protection and safe passage. Extend the back wall beyond the structure to complete the enclosure fence. Paint and maintain in a manner acceptable to the Owner and the Designer.
- G. Security Enclosure and Lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
1. Storage: Where materials and equipment must be stored and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.
- H. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and minimize the possibility that air, waterways, and subsoil might be contaminated or

polluted or that other undesirable effects might result. Avoid use of tools and equipment that produce harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near the site.

3.5 OPERATION, TERMINATION AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
 - 2. Protection: Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
- C. Termination and Removal: Unless the Designer requests that it be maintained longer, remove each temporary facility when the need has ended, when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are the Contractor's property. The Owner reserves the right to take possession of project identification signs.
 - 2. Remove temporary paving not intended for or acceptable for integration into permanent paving. Where the area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil in the area. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at the temporary entrances as required by the governing authority.
 - 3. At Substantial Completion, clean and renovate permanent facilities used during the construction period including, but not limited to, the following:
 - a. Replace air filters and clean inside of ductwork and housing.
 - b. Replace significantly worn parts and parts subject to unusual operating conditions.
 - c. Replace lamps burned out or noticeably dimmed by hours of use.

END OF SECTION 015000

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SECTION 017400 – CLEANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for cleaning during the Project.
- B. Environmental Requirements: Conduct cleaning and waste-disposal operations in compliance with local laws and ordinances. Comply fully with federal and local environmental and anti-pollution regulations.
 - 1. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
 - 2. Burning or burying of debris, rubbish, or other waste material on the premises is not permitted.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by the manufacturer or fabricator for the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 PROGRESS CLEANING

- A. General
 - 1. Retain all stored items in an orderly arrangement allowing maximum access, not impeding drainage or traffic, and providing the required protection of materials.
 - 2. Do not allow the accumulation of scrap, debris, waste material, and other items not required for construction of this Work.
 - 3. At least twice each month, and more often if necessary, completely remove all scrap, debris, and waste material from the jobsite.
 - 4. Provide adequate storage for all items awaiting removal from the jobsite, observing all requirements for fire protection and protection of the ecology.
- B. Site
 - 1. Daily, inspect the site and pick up all scrap, debris, and waste material. Remove all such items to the place designated for their storage.
 - 2. Weekly, inspect all arrangements of materials stored onsite. Re-stack, tidy, or otherwise service all material arrangements.

3. Maintain the site in a neat and orderly condition at all times.

3.2 FINAL CLEANING

- A. General: Provide final cleaning operations when indicated. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of Work to the condition expected from a commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
- B. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for the entire Project or a portion of the Project.
 1. Clean the Project Site, yard and grounds, in areas disturbed by construction activities including landscape development areas, of rubbish, waste material, litter, and foreign substances.
 2. Sweep paved areas broom clean. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 3. Remove petrochemical spills, stains, and other foreign deposits.
 4. Remove tools, construction equipment, machinery, and surplus material from the site.
 5. Remove snow and ice to provide safe access to the site.
 6. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 7. Broom clean concrete floors in unoccupied spaces.
 8. Remove labels that are not permanent labels.
 9. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 10. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 11. Leave the Project clean and ready for occupancy.
 12. Check temporary fences. Repair, replace, or make fences taut.
- C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid the Project of rodents, insects, and other pests. Comply with regulations of local authorities.
- D. Removal of Protection: Remove temporary protection and facilities installed during construction to protect previously completed installations during the remainder of the construction period.
- E. Compliances: Comply with governing regulations and safety standards for cleaning operations. Remove waste materials from the site and dispose of lawfully.
 1. Where extra materials of value remain after Final Acceptance by the Owner, they become the Owner's property.

END OF SECTION 017400

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SECTION 260100 - GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SPECIFICATION FORM AND DEFINITIONS

- A. These Specifications are abbreviated form and contain incomplete sentences. Omissions of words or phrases such as "the Contractor shall", "shall be", "as noted on the drawings", "according to the drawings", "a", "an", "the" and "all" are intentional. Omitted words and phrases shall be supplied by inference.
- B. When a word such as "proper", "satisfactory", "equivalent", and "as directed" is used, it requires Engineer's review.
- C. "Provide" means furnish and install.
- D. "Working Day" wherever used in these specifications shall mean the normal working days, Monday through Friday, exclusive of Saturday, Sunday and federally observed holidays.
- E. Architect-Engineer hereinafter abbreviated A/E shall mean both the Design Architects and Design Engineers.
- F. Design Engineer, hereinafter abbreviated D/E shall mean the Engineering firm, Case Engineering, Inc., 796 Merus Court, Fenton, MO 63026; Contact Person: Brian Wood, bwood@caseengineeringinc.com.
- G. Equipment and/or materials manufacturer hereinafter abbreviated E/M shall mean the manufacturer of equipment or materials specified or referred to.

1.3 GENERAL EXTENT OF WORK

- A. Provide electrical systems indicated on drawings, specified or reasonably implied. Provide every device and accessory necessary for proper operation and completion of electrical systems. In no case will claims for "Extra Work" be allowed for work about which contractor could have informed himself before bids were taken.
- B. Contractor shall familiarize himself with equipment provided by other Contractors which require electrical connections and controls.
- C. Make required electrical connections to equipment provided under Architectural and Mechanical divisions of this project, except where shown or specified otherwise. All temperature control electrical wiring and connections shall be by Electrical Contractor. Make required internal field wiring modifications indicated on wiring diagrams of factory installed control systems for control sequence specified. These field modifications shall be limited to jumper connections and connection of internal wiring to alternate terminal block lugs. Cost for field modifications requiring re-wiring of factory installed control systems for equipment provided by contractor or contractor shall be included in base bid of each respective Contractor.

- D. Check electrical data and wiring diagrams received from contractor for compliance with project voltages, wiring, controls and protective devices shown on electrical drawings. Promptly bring discrepancies found to attention of A/E for a decision.
- E. To maximum extent possible electrical controls in boiler rooms, equipment rooms, and control rooms shall be grouped in accessible locations and arranged according to function. Where possible use group control panels and combination starters in lieu of individually enclosed devices.

1.4 LOCAL CONDITIONS

- A. Visit site and determine existing local conditions affecting work in contract.
- B. Failure to determine site conditions or nature of existing or new construction will not be considered basis for granting additional compensation.

1.5 CODES, ORDINANCES, RULES AND REGULATIONS

- A. Provide work in accordance with applicable rules, codes, ordinances and regulations of Local, State, and Federal Governments, and other authorities having lawful jurisdiction.
- B. Conform to latest editions and supplements of following codes, standards or recommended practices.
 - 1. Safety Codes
 - a. National Electric Safety Code Handbook H30 - National Bureau of Standards.
 - b. Occupational Safety and Health Standards - Department of Labor.
 - c. Specifications for Making Buildings and Facilities Accessible To, and Usable By, the Physically Handicapped - American National Standards Institute ANSI A117.1.
 - 2. National Fire Codes:
 - a. NFPA No. 70 - National Electric Code, 2014 Edition.
 - b. NFPA No. 76A - Essential Electric Systems, latest edition.
 - c. NFPA No. 101 - Life Safety Code, latest edition.
 - 3. Underwriters Laboratories Inc.:
 - a. UL-508 - Standards for Industrial Control Equipment.
 - b. UL-1 008- Standard for Automatic Transfer Switches.

1.6 ALL MATERIALS, EQUIPMENT AND COMPONENT PARTS OF EQUIPMENT SHALL BEAR UL LABELS WHENEVER SUCH DEVICES ARE LISTED BY UL.

- A. Drawings and specifications indicate minimum construction standard, should any work indicated be sub-standard to any ordinances, laws, codes, rules or regulations bearing on work, contractor shall promptly notify A/E in writing before proceeding with work so that necessary changes can be made. However, if contractor proceeds with work knowing it to be contrary to any ordinances, laws, rules, and regulations, he shall thereby have assumed full responsibility for and shall bear all costs required to correct non-complying work.
- B. Contractor shall secure and pay for necessary permits and certificates of inspection required by governmental ordinances, laws, rules or regulations. Keep a written record of all permits and inspection certificates and submit two copies to A/E with request for final inspection.

1.7 CONTRACT CHANGES

- A. Changes or deviations from contract, including those for extra or additional work must be submitted in writing for review of A/E. No verbal orders will be recognized.
- B. Changes in the work shall be submitted in accordance with AIA Document A201. General Conditions of the Contract for Construction.
- C. All change proposals shall be itemized indicating separately the costs for materials, labor, restocking charges, freight, bonds, insurance, overhead and profit. All materials shall be listed separately with quantities and individual unit prices. Labor factors shall be from a nationally recognized source with appropriate adjustments.

1.8 LOCATIONS AND INTERFERENCES

- A. Locations of equipment, conduit and other electrical work is indicated diagrammatically by electrical drawings. Layout work from dimensions on Architectural and Structural Drawings. Verify equipment size from manufacturers shop drawings.
- B. Study and become familiar with contract drawings of other trades and in particular general construction drawings and details to obtain necessary information for figuring installation. Cooperate with other workmen and install work to avoid interference with their work. Minor deviations, not affecting design characteristics, performance or space limitation may be permitted if reviewed by A/E prior to installation.
- C. Any conduit, apparatus, appliance or other electrical item interfering with proper placement of other work as indicated on drawings, specified, or required, shall be removed and if so shown relocated and reconnected without extra cost. Damage to other work caused by contractor, his Sub- Contractor, his workmen or by any cause whatsoever, shall be restored as specified for new work.

1.9 SYSTEMS PERFORMANCE

- A. Final acceptance of work shall be subject to the condition that all systems, equipment, apparatus and appliance operate satisfactorily as designed and intended. Work shall include required adjustment of systems and control equipment installed under this specification division.

1.10 WARRANTY

- A. CONTRACTOR warrants to Owner and Architect the quality of materials, equipment, workmanship and operation of equipment provided under this specification division for a period of one year from and after date of substantial completion of building and acceptance of electrical systems by Owner.
- B. Where manufacturers' warranties expire during the one year warranty period, contractor shall include provisions for extending warranty for the full one year period and shall include cost for warranty extension in his base bid. Where warranty extensions are not available from manufacturer, supplier or installer, contractor shall provide labor, parts and material warranty services equal to the requirements of these specifications and the terms of the manufacturer, supplier and installer warranties.
- C. Contractor warrants to Owner and Architect that on receipt of written notice from either of them within one year warranty period following date of acceptance all defects that have appeared in

materials and/or workmanship, shall be promptly corrected to condition required by contract documents at contractor's expense.

- D. The above warranty shall not supersede any separately stated warranty or other requirements required by law or by these specifications.
- E. Keep an itemized list of all equipment warranties listing equipment by name, mark, and type along with length and expiration date of each warranty. Submit two copies to A/E with request for final inspection.
- F. If the Architect's specification includes a warranty that exceeds the above warranty requirements the Architect's warranty shall take precedence.

1.11 MATERIALS EQUIPMENT AND SUBSTITUTIONS

- A. The intent of these specifications is to allow ample opportunity for contractor to use his ingenuity and abilities to perform the work to his and Owner's best advantage, and to permit maximum competition in bidding on standards of materials and equipment required.
- B. Material and equipment installed under this contract shall be first class quality, new, unused and without damage.
- C. In general these specifications identify required materials and equipment by naming first the manufacturer whose product was used as the basis for the project design and specifications. The manufacturers product, series, model, catalog and/or identification numbers shall set quality and capacity requirements for comparing the equivalency of other manufacturer's products. Where other manufacturers names are listed they are considered an approved manufacturer for the product specified, however; the listing of their names implies no prior approval of any product unless specific model or catalog numbers are listed in these specifications or in subsequent addenda. Where other than first named products are used for contractor base bid proposal it shall be his responsibility to determine prior to bid time that his proposed materials and equipment selections are products of approved manufacturers which meet or exceed the specifications and are acceptable to the D/E.
- D. Where materials or equipment are described but not named, provide required items of first quality, adequate in every respect for intended use. Such items shall be submitted to A/E for review prior to procurement.
- E. Prior to receipt of bids, if contractor wishes to incorporate products other than those named in Specifications in his bid, he shall submit a written request for review of substitutions to D/E not less than seven working days prior to bid date. D/E will review requests and acceptable items will be listed in an addendum issued to principal bidders.
- F. Materials and equipment proposed for substitution shall be equal to or superior to that specified in construction, efficiency, utility, aesthetic design, and color as determined by A/E whose decision shall be final and without further recourse. Physical size of substitute brand shall be no larger than space provided including allowances for access for installation and maintenance. Requests must be accompanied by two copies of complete descriptive and technical data including E/M's name, model and catalog number, photographs or cuts, physical dimensions, operating characteristics and any other information needed for comparison.
- G. In proposing a substitution prior to or subsequent to receipt of bids, include in such proposal cost of altering other elements of Project, including adjustments in mechanical/electrical service

requirements necessary to accommodate such substitution; whether such affected elements be under this contract or under separate contracts.

- H. After execution of Contract, substitution of product brands for those named in Specifications will be considered, only if:
- I. Request is received within thirty days after Contract date and request includes statement showing credit due Owner, if any, if substitution product is used, or
- J. Owner requests consideration be given to substitute brands.

1.12 SHOP DRAWINGS, OPERATING AND MAINTENANCE INSTRUCTIONS

- A. Contractor shall furnish a minimum eight sets of shop drawings of all materials and equipment. A/E will retain four sets.
- B. Where catalog cuts are submitted for review, conspicuously mark or provide schedule of equipment, capacities, controls, fittings, sizes, etc. that are to be provided. Mark each submitted item with applicable section and paragraph numbers of these specifications, or plan sheet number when item does not appear in specifications. Where equipment submitted does not appear in base specifications or specified equivalent, submittals shall be marked with applicable alternate numbers, change order number or letters of authorization. Each submittal shall contain at least two sets of original catalog cuts. Each catalog sheet shall bear E/M's name and address. All shop drawings on materials and equipment listed by UL shall indicate UL approval on submittal.
- C. Contractor shall check all shop drawings to verify that they meet specifications and/or drawings requirements before forwarding submittals to the A/E for their review. All shop drawings submitted to A/E shall bear contractor approval stamp which shall indicate that contractor has reviewed submittals and that they meet specification and/or drawing requirements. contractor's submittal review shall specifically check for but not be limited to the following: equipment capacities physical size in relation to space allowed; electrical characteristics, provisions for supply, return and drainage connections to building systems. All shop drawings not meeting contractor's approval shall be returned to his supplier for resubmittal.
- D. No shop drawing submittals will be considered for review by the A/E without contractor's approval stamp, or that have extensive changes made on the original submittal as a result of contractor's review.
- E. A/E will not be responsible for the cost of returning shop drawing submittals that are submitted to them without contractor's review and approval stamp. A letter will be sent to contractor by either the Architect or Engineer indicating receipt of an improper submittal, contractor shall acknowledge receipt of letter and indicate his plans for pick-up or resubmitting. A/E will hold improper submittals for pick-up by contractor or supplier for 15 working days after date of receipt. If not picked up by the 16th working day, submittals will be disposed of by A/E.

F. A/E's review of shop drawings will not relieve contractor of responsibility for deviations from drawings and specifications unless such deviations have been specifically approved in writing by Owner of his representative, nor shall it relieve contractor of responsibility for errors in shop drawings. No work shall be fabricated until the A/E's review has been obtained. Any time delay caused by correcting and resubmitting shop drawings will be contractor's responsibility.

G. Operating and Maintenance Instructions:

1. Submit with shop drawings of equipment, one set of operating and maintenance instructions and parts lists for all items of equipment provided. Instructions shall be prepared by E/M.
2. Keep in safe place, keys and wrenches furnished with equipment under this contract. Present to Owner and obtain receipt for same upon completion of project.
3. Prepare complete brochure covering electrical systems and equipment provided under this contract. Submit brochures to A/E for review before delivery to Owner. Contractor at his option may prepare brochure or retain an individual to prepare it for him. Include cost of this service in base bid. Brochures shall contain following:
4. Certified equipment drawings and/or catalog data with equipment provided clearly marked as outlined under this specification.
5. One copy each of balance and test reports required and as outlined under this specification.
6. Complete operating and maintenance instructions for each item of equipment.
7. Special emergency operating instructions with a list of service organizations (including addresses and telephone numbers) capable of rendering emergency service to various parts of electrical system.
8. Provide brochures bound in Wilson Jones No. B3-367-49R or National No. 82-87-684 3" capacity red vinyl guarded three ring binder with metal hinge. Reinforce binding edge of each sheet of loose-leaf type brochure to prevent tearing from continued usage. Clearly print on front cover label of each brochure the following:
9. Project name and address.
10. Section of work covered by brochure, i.e. "Electrical".

1.13 RECORD DOCUMENTS

A. Record Drawings: Maintain a reproducible set of contract drawings and shop drawings in clean, undamaged condition, with mark-up of actual installations which vary substantially from the work as originally shown. Mark whichever drawing is most capable of showing "field" condition fully and accurately; however, where shop drawings are used for mark-up, record a cross-reference at corresponding location on working drawings. Mark with red erasable red pencil and, where feasible, use other colors to distinguish between variations in separate categories of work. Mark-up new information which is recognized to be of importance to Owner, but was for some reason not shown on either contract drawings or shop drawings. Give particular attention to concealed work, which would be difficult to measure and record at a later

date. Note related change-order numbers where applicable. Organize record drawing sheers into manageable sets, bind with durable paper cover sheets, and prints suitable titles, dates and other identification on cover of each sheet.

- B. Record Specifications: Maintain one copy of specifications, including addenda, change orders, and similar modifications issued in printed form during construction, and mark-up variations (of substance) in actual work in comparison with text of specifications and modifications as issued. Give particular attention to substitutions, selection of option, and similar information on work where it is concealed or cannot otherwise be readily discerned at a later date by direct observation. Note related record drawing information and product data, where applicable. upon completion of mark-up submit to Architect/Engineer for Owner's records.
- C. The Contractor shall provide a full set of photographs showing the entire underground equipment. The photographs shall be taken prior to any concrete being poured. The underground equipment shall consist of, but not be limited to, the following:
 - Piping
 - Conduits
 - Ductwork
- D. The Contractor shall provide the photographs in an 8.5" x 11" format for record keeping purposes with the maintenance manuals. The photos shall all be digital and a disk or C.D. shall be provided to the Owner as a permanent record.
- E. As-built documents shall be submitted for approval prior to final payment. Copies of "In-Progress" as-built drawings shall be submitted at each pay request.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

PART 4 - EXHIBITS

4.1 EXHIBIT A

- A. SUBSTITUTION REQUEST FORM following the end of this section.

END OF SECTION 260100

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SECTION 260500 - BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections and section 260100 - General Electrical Requirements shall apply to this Section.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 CIRCUITING

- A. Follow circuiting shown on drawings for lighting, power and equipment connections.

3.2 CUTTING AND PATCHING

- A. Contractor shall do cutting and patching of building materials required for installation of work herein specified. Cut no structural members without Architect's approval and in a manner approved by him.
- B. Patching shall be by mechanics of particular trade involved and shall meet approval of Architect.
- C. Drilling and cutting of openings through building materials require Architect's review and approval. Make openings in concrete with concrete hole saw or concrete drill. Do not use star drill or air hammer for this work.

3.3 SLEEVES

- A. Provide proper type and size sleeves for electrical ducts, busses, conduits, etc. passing through building construction. Where sleeves are installed by Others, supervise installation to insure proper sleeve location. Unless indicated or approved, install no sleeves in structural members. Sleeves shall be installed in concrete or masonry walls or floors and where otherwise noted.
- B. Each sleeve shall be continuous through wall floor or roof and shall be cut flush on each side except where indicated otherwise. Sleeves shall not be installed in structural member except where indicated or approved. Sleeves shall be required through floors subject to flooding such as toilet rooms, equipment rooms and kitchens. The contractor shall have the option of:
- C. Providing a cast iron sleeve with integral flanges extending 1 inch above finished floor. Sleeve shall be cast in concrete when floor is poured. Annular space between sleeve and pipe shall be filled with Kaowool.

or
- D. Provide core-drilled opening in concrete with Thunderline Unk-Seal or Calpico Sealing Linx between piping and opening.

- E. Sleeves passing through floors and exterior walls with waterproof membranes shall be core-drilled (floors only) and sealed with Thunderline Link-Seal or Calpico Sealing Linx.
- F. Where electrical ducts, busses, conduits, wiring, etc. passed through fire walls, floors, and smoke partitions seal annular space between sleeve and item passing thru with Kawool Fire Master Bulk Packing. Packing thickness shall be sized per manufacturer's recommendation for maintaining the integrity of the fire wall/floor or smoke partition. Fire protection system shall be rated per ASTM E 119. Equivalents to Kaowool are 3M, Flame Stop, or Flame Safe.
- G. Where piping passes through walls serving as supply or exhaust air plenums or chases, seal annular space between pipe and sleeve air tight with Thunderline Link-Seal or Calpico Sealing Linx.

3.4 MUTILATION

- A. Mutilation of building finishes, caused by installation of electrical equipment, fixtures, outlets and other electrical devices shall be repaired at contractor's expense to approval of Architect.

3.5 EXCAVATION AND BACKFILL

- A. Perform necessary excavating to receive work, provide necessary sheathing, shoring, cribbing, tarpaulins, etc. as required and remove same at completion of work. Perform excavation in accordance with appropriate section of these specifications, and in compliance with OSHA Safety Standards.
- B. Excavate trenches of sufficient width to allow ample working space, and no deeper than necessary for installation of work.
- C. Conduct excavations so no walls or footings are disturbed or injured. Backfill excavations made under or adjacent to footings with selected earth or sand and tamp to compaction required by A/E. Mechanically tamp backfill under concrete and pavings in 6 inch layers to 95% standard density.
- D. Backfill trenches and excavations to required heights with allowance made for settlement. Tamp fill material thoroughly and moistened as required for specified compaction density. Dispose of excess earth, rubble and debris as directed by Architect.
- E. When available refer to test hole information on Architectural drawings or specifications for types of soil to be encountered in excavations. Where rock is indicated, list unit cost for rock excavation in base bid.

3.6 SETTING, ADJUSTMENT AND EQUIPMENT SUPPORTS

- A. Work shall include mounting, alignment and adjustment of systems and equipment. Set equipment level on adequate foundations and provide proper anchor bolts and isolation as shown or specified. Level, shim, and grout equipment bases as recommended by E/M. Mount motors, align and adjust drive shafts and belts according to E/M's instructions. Equipment failures resulting from improper installation or field alignment shall be repaired or replaced by contractor at no cost to Owner.
- B. Provide concrete bases for all floor and slab mounted equipment. Refer to drawings for required base type and size. Provide 3 1/2" high base where base is not shown on drawings.

- C. Provide each piece of equipment or apparatus suspended from ceiling or mounted above floor level with suitable structural support, platform or carrier in accordance with best recognized practice. contractor shall arrange for attachment to building structure, unless otherwise indicated on drawings or specified. Provide hangers with vibration eliminators where required. Contractor shall verify that structural members of building are adequate to support equipment. Submit details of hangers, platforms and supports together with total weights of mounted equipment to A/E for review before proceeding with fabrication or installation.

3.7 PAINTING OF MATERIALS AND EQUIPMENT

- A. Equipment and materials exposed to interior dry environment shall have a minimum of one primer and one finish coat. Equipment and materials mounted in exterior location shall have a minimum of one primer and two coat colors in finish areas shall be selected by A/E.
- B. After installation, damage to painted surfaces shall be properly prepared and primed with primers equal to factory materials. Finish coating shall be same color and type as factory finish.
- C. Where extensive refinishing of factory applied finishes are required equipment shall be completely repainted. A/E will make final determination on extent of refinishing required.

3.8 MAINTENANCE OF SYSTEMS

- A. Contractor shall be responsible for operation, maintenance and lubrication of equipment installed under his contract through substantial completion.

3.9 PROTECTION AND CLEANING OF SYSTEMS AND EQUIPMENT

- A. It shall be contractor's responsibility to protect and prevent damage to all electrical materials and equipment stored and/or installed under this contract. All work, materials and equipment shall be adequately protected by any and all means necessary to prevent damage by weather, flooding, condensation, construction debris, fire, and construction equipment and vehicles.
- B. Where job conditions, or work of other contractors produce the potential for damage to electrical systems and equipment, contractor shall immediately notify the G/C so that corrective action can be taken.
- C. Contractor shall take extra precautions to protect electrical equipment containing solid state electronics, open relays, and contacts from damage by water, dust, dirt, construction debris and the formation of condensate. All equipment so damaged shall be replaced by contractor with new equipment at no cost to Owner.
- D. Contractor shall periodically inspect and clean all systems and equipment to insure all systems and equipment remain in like new condition during construction. All cleaning shall be done in accordance with E/M's recommendation where available and applicable.
- E. Before request for final inspection all systems and equipment shall be properly cleaned, vacuumed, polished, painted, etc. as required to return equipment to like new appearance.
- F. All equipment requiring painting or touch-up shall be properly prepared and painted in accordance with this specification.
- G. Contractor shall keep a written record listing systems and equipment cleaned. Where special procedures or chemicals were used or where partial or complete disassembly of factory

assembled equipment was necessary, contractor shall list special procedures and/or disassembly required and equipment components affected. Prior to final inspection contractor shall submit two copies of cleaning record to A/E for their records.

3.10 START-UP, CHANGE-OVER, TRAINING AND OPERATING CHECK

- A. Contractor shall perform initial start-up of systems and equipment. Personnel qualified to start-up and service this equipment, including manufacturers technicians, when specified, and Owner's operating personnel shall be present during these operations.
- B. Contractor shall be responsible for training Owner's operating personnel to operate and maintain systems and equipment installed. Keep a record of training provided to Owner's personnel listing the date, subject covered, instructor's name, names of Owner's personnel attending and total hours of instruction given each individual.
- C. Contractor shall report in person to Owner's operating Engineer at end of first month of operation and thereafter at end of first month of operation and thereafter at end of sixth and twelfth months after date of substantial completion of building to check operation of equipment that was installed under contract. Contractor shall answer operating personnel's questions regarding system operation and shall ascertain that systems are operating normally and are being properly maintained by Owner. If contractor finds that systems are not being operated and maintained as designed, he shall inform the Building Engineer/Owner and A/E in writing.
- D. After each inspection, contractor shall submit written report to A/E indicating condition of equipment and including any recommended changes in operation of system or other information which will be helpful to Owner.

3.11 PRE-FINAL AND FINAL CONSTRUCTION REVIEW

- A. At contractor's request, A/E will make pre-final construction review to determine if to the best of their knowledge project is completed in accordance with plans and specifications. Items found by A/E as not complete or not in accordance with requirements of contract will be outlined in report to contractor. After completion and/or correction of these items, contractor shall notify Architect he is ready for final review.
- B. At same time of final construction review, contractor and his major sub-contractors shall be present or be represented by a person of authority. Each Contractor shall demonstrate, as directed by A/E, that his work complies with purpose and intent of plans and specifications. Each Contractor shall provide labor, services, instruments, and tools necessary for such demonstrations and tests.

3.12 RECORDING AND REPORTING TESTS AND DATA

- A. Record nameplate horsepower, amperes, volts, phase service factor and other necessary data on motors and other electrical equipment furnished and/or connected under this contract.
- B. Record motor starter catalog number, size and rating and/or catalog number of thermal-overload units installed in all motor starters furnished and/or connected under this contract. See motor starter specification for instructions for proper sizing of thermal-overload units.
- C. Record amperes-per-phase at normal or near-normal loading of each item of equipment furnished and/or connected.

- D. Record correct readings of each feeder conductor after energized and normally loaded, and again after balancing of feeder loads as required by current readings.
- E. Record voltage and amperes-per-phase readings taken at service entrance equipment after completion of project with building operating at normal electrical load. This reading shall be taken continuously for a 24 hour period and recorded on permanent tape and submitted to A/E.
- F. Record voltage and amperes at transformer secondary and primary stations, at normal loading. Record transformer percentage "taps" finally selected. Transformers shall be connected to produce voltage at building service entrance equipment as follows:

Nominal System Voltage	Service Entrance Voltage
460	480
200	208

- G. Submit at least two (2) copies of data noted above to A/E for review prior to final inspection.
- H. Keep a record of all deviations made from routes, locations, circuiting, etc. shown on contract drawings. Prior to final inspection submit one new set of project drawings with all deviations and changes clearly indicated.

END OF SECTION 260500

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SECTION 260600 - GROUNDING AND BONDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections, section 260100 - General Electrical Requirements, and section 260500 - Basic Electrical Materials and Methods shall apply to this Section.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 – EXECUTION

- A. Supplement grounded neutral of secondary distribution system with equipment grounding system, installed so that metallic structures, enclosures, raceways, junction boxes, outlet boxes, cabinets, machine frames, portable equipment and other conductive items operate continuously at ground potential and provide low impedance path for ground fault currents. System shall comply with National Electrical Code, modified as indicated on drawings as specified.
- B. Provide equipment ground bus in base of low voltage switchgear or switchboard. Braze or otherwise adequately connect ground system to at least three 3/4" diameter by 10'-0" long ground rods. Where extra rods are necessary to meet requirements of specified tests, E/C shall be reimbursed for additional cost. Rods shall be located a minimum of six feet from each other of any other electrode and shall be interconnected by a minimum 3/0 bare copper conductor brazed to each ground rod below grade.
- C. Ground metallic water piping system to electrical service ground with a minimum 3/0 or as required green insulated copper ground conductor, in conduit. Where a dielectric main water fitting is installed, connect ground conductor to building side of dielectric water fittings. Do not install jumper around dielectric water fitting. Bond conduit to ground conductor at each end. Provide 3/0 jumper with ground clamps around water meter.
- D. Provide grounding electrode system as required by the Latest National Electrical Code, Section 250-81 -H.
- E. Connect system neutral ground and equipment ground system to common ground bus.
- F. Ground secondary services at supply side of each individual secondary disconnecting means and at related transformers in accordance with National Electric Code. Provide each service disconnect enclosure with neutral disconnecting means which interconnect with insulated neutral and uninsulated equipment ground sub to establish system common ground point. Neutral disconnecting links shall be located so that low voltage neutral bar with interior secondary neutrals can be isolated from common ground bus and service entrance conductors.
- G. Required equipment grounding conductors and straps shall be sized in compliance with N.E.C. Table 250-95. Equipment grounding conductors shall be provided with green type TW 600 volt insulation. Related feeder and branch circuit grounding conductors shall be connected to ground bus with approved pressure connectors. Provide feeder servicing several panelboards with a continuous grounding conductor connected to each related panelboard ground bus.
- H. Provide low voltage distribution system with a separate green insulated equipment grounding conductor for each single or three-phase feeder, and each branch circuit except as specified

herein. Where more than one branch circuit is installed in a common raceway only one grounding conductor is required. Grounding conductor shall be sized for largest branch circuit overcurrent device serving common raceway.

- I. Single phase 120 volt branch circuits for lighting shall consist of phase, neutral and grounding conductors installed in common metallic conduit. Provide flexible metallic conduit utilized in conjunction with above single phase branch circuits with suitable green insulated grounding conductors. Feeders and branch circuits in non-metallic conduits shall be provided with separate grounding conductor. Install grounding conductor in common conduit with related phase and/or neutral conductors. Where parallel feeders are installed in more than one raceway, each raceway shall have a green insulated equipment grounding conductor.
- J. E/C shall provide equipment grounding bars for termination of equipment grounding conductors in panelboards and other electrical equipment. In addition to active circuits, provide pressure connectors for panel spares and blank spaces.
- K. Provide electrical expansion fitting with an external flexible copper ground securely bonded by approved grounding straps on each end of fitting except where UL approved built-in copper grounding device is provided.
- L. Provide non-metallic conduits or ducts with equipment grounding conductors except for conditions as follows:
 - 1. Where ducts are for telephone or communication uses only.
- M. Connect each cable rack system to equipment grounding system with insulated conductor with size determined by largest power conductor in rack. Minimum size shall be No. 6 and maximum size shall not exceed equivalent capacity of number 4/0 copper conductor. Ground conductor shall be bonded to rack system, enclosed in conduit, and connected to common ground bus.
- N. Provide electric devices such as air cleaners or heaters control switch, etc., installed in air ducts, with insulated equipment ground conductor sized on rating of overcurrent device supplying unit. Bond conductor to each unit, air duct, and to ground in panelboard.
- O. Provide electric immersion type water heater or surface heating cables with insulated equipment ground conductor sized on rating of overall device supplying unit. Bond conductor to water piping at unit and to ground bar in panelboard.
- P. Provide steel and aluminum conduits which terminate without mechanical connection to metallic housing of electrical equipment with ground bushing and connect each bushing with bare copper conductor to ground bus in electrical equipment. Electrically non-continuous metallic conduits containing ground wiring only shall be bonded to ground wire at both conduit entrance and exit.
- Q. Ground and bond exterior mounted light poles, radio and television masts and flag poles with No. 6 or larger bare copper wire connected to 96" long, 3/4" copper clad ground rod driven in ground.
- R. Test complete equipment grounding system to each service disconnect enclosure ground bar with Vibroground test unit manufactured by Associated Research Inc. Resistance, without chemical treatment or other artificial means shall not exceed five (5) ohms to ground. Submit certified test reports of compliance with five (5) ohm value.

END OF SECTION 260600

SECTION 260720 - ELECTRICAL SUPPORTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections, section 260100- General Electrical Requirements, and section 260500 - Basic Electrical Materials and Methods shall apply to this Section.

PART 2 - PRODUCTS

2.1 INDIVIDUAL CONDUITS SUSPENDED FROM CEILING SHALL BE SUPPORTED BY STEEL CITY NO. C-1 49 HANGERS.

- A. Provide inserts, hangers and accessories with finish as follows:
- B. Galvanized: Concrete inserts and pipe straps.
- C. Galvanized or Cadmium Plated: Steel bolts, nuts, washers, and screws.
- D. Painted with Prime Coat: Individual hangers, trapeze hangers and rods.
- E. Equivalent hanger and support systems by Binkley, Fee and Mason, Kin-Line or Unistrut.
- F. Inserts shall be Grinnel Figure 279, 281, 282, or 285 or equivalent as required by load and concrete thickness.
- G. Provide beam clamps suitable for structural members and conditions.
- H. Provide 3/8" minimum diameter steel hanger rods galvanized or cadmium-plated finish.
- I. Trapeze hangers shall be Kindorf Series 90 channel with fittings and accessories as required.
- J. Attach each conduit to trapeze hanger with Steel City No. C-1 05 clamps for rigid conduit and Steel City No. C-1 06 clamps for electrical metallic tubing (EMT).

PART 3 - EXECUTION

3.1 ELECTRICAL SUPPORTS:

- A. Support vertical and horizontal conduit runs at intervals not greater than 10 feet, within 3 feet of any bend and at every outlet or junction box. Where plastic conduit is used follow E/M's recommended hanger spacing.
- B. Install multiple runs of conduits as follows:
- C. Where a number of conduits are to be run exposed and parallel, group and support with trapeze hangers.
- D. Fasten hanger rods to structural steel members with suitable beam clamps and to concrete structures with inserts set flush with surface. Install concrete inserts with reinforced rod through opening provided in inserts.

- E. Install clamps for single conduit runs as follows:
- F. Support individual runs by approved pipe straps, secured by toggle bolts on hollow masonry; expansion shields and machine screws or standard preset inserts on concrete or solid masonry; machine screws or bolts on metal surfaces; and wood screws on wood construction. Use of perforated strap not permitted.
- G. Install exposed conduits in damp locations with clamp backs under each conduit clamp to prevent accumulation of moisture around conduits.

END OF SECTION 260720

SECTION 260750 - ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections, section 260100 - General Electrical Requirements, and section 260500 - Basic Electrical Materials and Methods shall apply to this Section.

PART 2 - PRODUCTS

2.1 ELECTRICAL IDENTIFICATION:

- A. Provide identification and warning signs to wiring and equipment as listed in schedule. Signs and tags shall be as follows:
 - TYPE 1: Laminated phenolic plastic with black Gothic-condensed lettering by Seaton or Wilco.
 - TYPE 2: Self-sticking 1/2" wide plastic tape with high gloss surface and embossed lettering by Brady or Dymo.
 - TYPE 3: Self-sticking polyester sign with wording and size conforming to ANSI Standard Z35.1 - 1964 and OSHA 19.0.144iii(2) Specifications, by Brady or as approved.
 - TYPE 4: Self-sticking flexible vinyl with oil resistant adhesive for -20 degrees to 300 degrees F. temperatures by Brady or as approved.
- B. Provide switchboards with Type 1 signs 2-1/2" x 12" indicating switchboards designation and electrical characteristics as noted on drawings. Provide switchboards sections operating at different voltages with Type I sign 2" x 8" indicating electrical characteristics of section. Provide each switchboard device with Type 1 sign 1-1/4" x 5" indicating load served.
- C. Provide distribution panelboards with Type 1 signs 2" x 8" indicating panel designation and electrical characteristics. Provide branch devices with Type 1 sign 1" x 4" indicating load served.
- D. Provide lighting and power panelboards with Type 1 sign 1-1/4" x 6" indicating panel designation, electrical characteristics, and source of power. Source of power indication shall indicate source panel designation and switch or breaker number. Mount inside of panel door on circuit breaker trim flange just below breakers.
- E. Provide disconnect switches, time switches, lighting contactors, motor starters and controllers with Type 1 sign 1-1/4" x 6" indicating equipment served, electrical characteristics, and source of power,
- F. Provide electrical equipment and accessible wiring enclosures operating at voltage above 240 volts with Type 3 Brady No. AE-461 25 warning sign and Brady Style B, 1-1/8" x 4-1/2" voltage marker applied to front door or cover of device or enclosure. Provide large equipment such as transformers and main distribution equipment with Type 3 sign Brady No. AE-46639.
- G. Provide feeders and branch circuit home runs with Type 4 wire marker indicating circuit number and power source. Provide feeders phase identification letter at each terminal point in addition to its circuit number.
- H. Provide Type 2 tape at feeder terminal lugs to switchboards and panelboards. Tape shall indicate conduit size, conductor type and AWG size. Tape shall be located to be easily read with conductors installed.

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION 260750

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SECTION 261200 - CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections, section 260100 - General Electrical Requirements, and section 260500 - Basic Electrical Materials and Methods shall apply to this Section.

PART 2 - PRODUCTS

2.1 CONDUCTORS

- A. Unless noted otherwise conductors referred to are wires and cable. Provide code grade soft annealed copper conductors with specified insulation type in proper colors to conform with color coding specified. Provide conductors No. 8 gauge and larger stranded and conductors No. 10 gauge and smaller may be solid or stranded.
- B. Use no conductors smaller than No. 12 gauge unless specifically called for or approved by D/E. Size wire for 120 volt branch Circuits for 3% maximum voltage drop. Size feeder circuits for 2% maximum voltage drop. Combined voltage drop of feeders and branch circuits shall not exceed 5% maximum.
- C. Provide conductors for listed applications as follows:
 - 1. Lighting and Receptacle Circuits: Type THHN, 600 volt, 90 degree C (194 degrees F) thermoplastic insulated building conductor.
 - 2. Power Circuits and Feeders: Type THHN, 600 volt, 90 degree C (194 degrees F) thermoplastic insulated building conductor.
 - 3. Low Voltage and Line Voltage Conductors Sizes No. 16 and No. 18 AWG: Type TFFN, 600 volt 90 degrees C (194 degrees F) thermoplastic insulated building conductor.
 - 4. Underground Power Feeders to panelboards: Type THHN / TWHN, 600 volt, 75 degree C (167 degrees F) wet rating and 90 degree C (194 degrees F) dry rated thermosetting filled insulating cable.
 - 5. Underground Power Circuits and Feeders from panels to campsites: Type USE direct burial cable.
- D. Provide conductors by Anaconda, General Cable, General Electric, Phelps Dodge, or equivalent.

2.2 CONDUCTOR COLOR CODING

- A. Provide continuous color coding for feeder, branch and control circuits. Insulation or identification tape color shall be same color for like circuits throughout. Where specified insulation colors are not available in larger wire sizes color code conductor at all accessible locations with Scotch 35 all-weather color code tape.
- B. Identify the same phase conductor with same color throughout.

- C. Provide conductors with color coding indicated. Where more than one standard voltage system is installed provide same colored conductors with indicated tape or stripe to indicate system voltage.

SYSTEM VOLTAGE	CIRCUIT	INSULATION COLOR	STRIPE COLOR
277/480	Neutral	White	Orange
277/480	Phase A	Brown	--
277/480	Phase B	Orange	--
277/480	Phase C	Yellow	--
120/208	Neutral	White	--
120/208	Phase A	Black	--
120/208	Phase B	Blue	--
120/208	Phase C	Red	--
277/480	Switch	Same as Ph. Color	White
120/208	Switch	Same as Ph. Color	White
277/480	3-Way Sw Runner	Purple	Orange
120/208	3-Way Sw Runner	Purple	--
120/208	Control	Pink	--
277/480	Equip. Ground	Green	Yellow
120/208	Equip. Ground	Green	--

PART 3 - EXECUTION

3.1 CONDUCTOR INSTALLATION

- A. Run conductors in conduit continuous between outlets and junction boxes with no splices or taps pulled into conduits.
- B. Neatly route, tie and support conductors terminating at switchboards, motor control centers, panelboards, sound equipment, etc. with Thomas & Betts Ty-Rap cable ties and clamps or equivalent by Electrovert or Panduit.
- C. Make circuit conductor splices with Buchanan B-Cap nylon insulated connectors or equivalent by Ideal or 3M.
- D. Make fixture and device taps with Scotchlock self- stripping electrical tap connectors.
- E. Terminate solid conductors at equipment terminal strips and other similar terminal point with insulated solderless terminal connectors. Terminate all stranded conductor terminal points with insulated solderless terminal connectors. Provide Thomas & Betts Sta-Kon insulated terminals and connectors or equivalent by API/AMP Blackburn, Buchanan or Scotchlock.
- F. Where a total of six or more control and feeder conductors terminates in a multiple device panel or enclosure that has no built-in terminal blocks provide mounting channel and see-thru covers. Equivalent terminal blocks by General Electric, Square "D" or Westinghouse.
- G. Wrap conductor taps and connections requiring additional insulation with a minimum of three overlapped layers of 3 M Scotch vinyl plastic electrical tape No. 88 or equivalent,

END OF SECTION 261200

SECTION 261300 - RACEWAYS AND BOXES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections, section 260100 - General Electrical Requirements, and section 260500 - Basic Electrical Materials and Methods shall apply to this Section.

PART 2 - PRODUCTS

2.1 STEEL CONDUIT

- A. Rigid Conduit: Provide steel conduit meeting current ANSI Standard Specification C80.1 with hot-dipped galvanized and clear lacquer finish.
- B. Electrical Metallic Tubing (EMT): Provide thinwall conduit meeting current ANSI Standard Specification C80.3 with electro-galvanized and clear lacquer finish.
- C. Rigid Conduit and EMT Fittings: Provide Appleton Form 35 non-thread malleable iron unilets. Equivalent by CrouseHinds or Pyle National.
- D. Rigid Conduit Connectors and Couplings: Provide Appleton steel NO-THREAD TYPE, rain and concrete tight. Equivalent by Thomas and Betts or Steel City.
- E. EMT Connectors and Couplings: Provide Appleton steel COMPRESSION THINWALL TYPE, rain and concrete tight. Equivalent by Thomas and Betts or Steel City.
- F. Liquid-Tight Flexible Conduit Fittings: Appleton "STB" series insulated connectors. Equivalent by Pyle-National or Thomas and Betts.
- G. Provide insulated throat fittings when type THHN/THWN conductors are installed.
- H. All wiring shall be in steel conduit unless otherwise noted.
- I. Short runs of flexible galvanized steel conduit may be used where permitted by code. Lengths greater than 6 feet require review by Engineer.
- J. Make conduit connections to motors and equipment mounted on resilient mounts or vibration isolators with Type U.A. liquid-tight flexible conduit manufactured by Anaconda, or "Liquatite" by Electric-Flex Company.
- K. Where conduits cross building expansion joints provide O-Z expansion fitting type "AX", "TE", "EX" or "EXE" as required.
- L. Provide low voltage control systems and sound systems in conduit unless noted otherwise.
- M. Set screw type conduit fittings will not be allowed.

2.2 PLASTIC CONDUIT

- A. Normal duty applications in concrete slabs or underground without concrete encasement. Provide rigid polyvinyl chloride (PVC) type EPC 40 heavy wall plastic conduit meeting current NEMA Standard TC-2. Conduit shall be listed UL 651 for underground and exposed use.
- B. Normal duty exterior underground application direct burial: Provide semi-rigid polyvinyl chloride (PVC) type DB plastic duct meeting current NEMA Standard TC-6 and Western Underground Committee Specifications.
- C. Normal exterior underground application encased burial: Provide semi-rigid polyvinyl chloride (PVC) type A plastic conduit meeting current NEMA and Western Underground Committee Specifications.
- D. Provide matching plastic conduit fittings by E/M. Fittings shall meet the same Standards and specifications as the conduit on which it is installed.
- E. Joining and bending of conduit and installation of fittings shall be done only by methods recommended by E/M.
- F. Provide conduit support spacing as recommended by E/M for the highest ambient temperature expected,
- G. Provide interlocking conduit spacers by E/M or multiple runs of underground conduits installed in same trench.
- H. Ends of feeder conduit terminating at transformers, switchgear, manholes, etc. shall be terminated with bell ends to protect conductor insulation.
- I. Install no plastic conduit in areas where ambient temperature may exceed 150 degrees under normal conditions nor on heat producing equipment such as boilers, incinerators, etc. Install no plastic conduit in a return air or supply air plenum for the HVAC systems.
- J. Provide expansion couplings on conduits located in areas where ambient temperatures are constantly changing and on long runs regardless of ambient temperatures. Determine amount of conduit expansion and contraction from E/M's published charts or tables.
- K. Plastic conduit and fittings shall be by Carlon Products Division of Continental Oil Company.
- L. Plastic conduit shall not be used above grade for any purpose. All transitions from PVC to steel shall be made below grade.

2.3 BUSHINGS AND LOCKNUTS

- A. Enter outlet boxes squarely and securely clamp conduit to outlet box with bushing on inside and locknut on outside. Provide Thomas and Betts #3800 Efcor 56 series or equivalent threaded malleable iron insulated throat grounding bushings.
- B. Terminate metallic conduits at switchboards, panelboards, control cabinet, etc. with O-Z Electrical Manufacturing Company Type "BL" or "IGB" grounding type insulation bushings. Ground bushings to equipment grounding buss.

2.4 OUTLET BOXES

- A. Provide electrical service outlets, including plug receptacles, lamp receptacles, lighting fixtures and switches with Steel City, Raco, or equivalent 4 inch code gauge steel knockout boxes galvanized or sheradized of required depth for service or device.
- B. Provide code gauge galvanized steel raised covers on outlet boxes installed in plaster finish. Set to plaster grounds with outside edge of cover flush with plaster finish.
- C. Provide 3/8" or larger fixture stud in each outlet box scheduled to receive lighting fixture. Select covers with proper opening for device installed in outlet box.
- D. Use of utility or "Handy" boxes acceptable only where single gang flush outlet box in masonry is "dead-end" with only one conduit entering box from end or back.
- E. Use no sectional outlet boxes.
- F. Provide Appleton FS or FD unilets for surface mounted exterior work. Provide complete with proper device cover and gasket. Provide blank cover and gasket when used as junction box.

2.5 PULL BOXES, WIREWAYS AND GUTTERS

- A. Provide Alwalt, Keystone, Universal or equivalent code gauge pull boxes, wireways, and gutters indicated or required for installation, sized to conform with NEC rules. Provide complete with necessary fittings, interconnecting nipples, insulating bushings, conductor supports, covers, gaskets, partitions, etc. as required,
- B. Special items may be fabricated locally, to same general design and specifications as those listed in specified manufacturers catalogs. Provide free of burrs, sharp edges, unreamed holes, sharp pointed screws or bolts, and finished with one coat of suitable enamel inside and out, prior to mounting.
- C. Provide sectional covers for easy removal.

2.6 FLOOR BOXES

- A. On-grade applications: Unless noted otherwise, provide Hubbell System One type S1PFB with sub plates as required for devices and connections required. Provide universal cover finish as selected by architect or owner's representative. Provide furniture feeds if necessary for connection to furniture provided by others. Provide multiple floor boxes if necessary for quantity of devices, conduits or connection types shown on power plan.
- B. Where poke-through floor outlets are shown (above grade applications): unless noted otherwise, provide Hubbell System One S1PT series in exact model to accommodate installation, sub plates as required and cover plate materials as selected by architect.
- C. Prior to ordering, verify compatibility of floor box dimensions and configurations with overall construction.

PART 3 - EXECUTION

3.1 CONDUIT INSTALLATION

- A. Conduit materials, by application, shall be as follows:

1. Exterior above grade feeders service entrances and feeders: Rigid steel. Transition below grade from schedule 40 PVC.
 2. Interior branch circuits and feeders: EMT. Exception: Concealed branch circuits (#8 AWG and smaller) may be Type MC cable.
 3. Underground feeder conduits, service entrance conduits and branch circuit conduits: Schedule 40 PVC. Burial depth shall meet cover requirements of NEC. [Refer to N.E.C. Table 300.5]. PVC conduits shall have 24" burial depth under parking lots, driveways and areas with vehicular traffic.
 4. Feeder and service entrance conduit elbows/bends shall be galvanized steel.
 5. All above grade or above slab conduits shall be metallic.
- B. In general conceal conduit within walls, floors, roof construction or furred spaces. Expose only feeders and short connections to equipment in equipment rooms unless noted otherwise. Install exposed conduit parallel or at right angles to building lines.
- C. Install conduit to requirements of structure, other work on project and clear of openings, depressions, pipes, ducts, reinforcing steel, etc. Install conduit in concrete forms so that strength of structure will not be affected.
- D. Align conduit terminations at panelboard, switchboards, motor control equipment, junction boxes, etc. and install true and plumb. Provide supports or templates to hold conduit alignment during rough-in stage of work.
- E. Install conduit continuous between outlet boxes, cabinets and equipment. Make bends smooth and even without flattening or flaking conduits. Radius of bends shall not be shorter than radius listed in table 346-1 0(b) of NEC. Long radius elbows may be used where necessary.
- F. Ream and clean conduit before installation, and plug or cover openings and boxes to keep conduit clean during construction.
- G. Install no conduits or other raceways sized smaller than permitted in applicable NEC tables. Where conduit sizes shown on drawings are smaller than permitted by code, E/C shall include cost for proper size conduit in his base bid. In no case reduce conduit sizes indicated on drawings or specified without written approval of A/E. Fasten conduit securely in place with approved straps, hangers and steel supports. Provide O-Z cable support to support conductors in vertical raceways as required by NEC Table 300-1 9(a) of NEC. Where special hangers are required, submit hanger details to A/E for review before installation.

3.2 LOCATION OF OUTLET BOXES

- A. Locate outlet boxes generally from column centers and finished wall lines. Install ceiling outlet boxes at suspended ceiling elevations.
- B. Accurately locate lighting fixtures and appliance outlet boxes mounted in concrete or in plaster finish on concrete. Install outlet boxes in forms to dimensions taken from bench marks, columns, walls, or floors. Rough-in lighting fixtures and appliance outlet boxes to general locations before installation of walls and furring and reset to exact dimensions as walls and furring are constructed. Set outlet boxes true to horizontal and vertical finish lines of building. If outlet is shown to be installed in or on a column, outlet shall be centered on column.
- C. Install outlet boxes accessible. Provide outlet boxes above piping or ductwork with extension stems or offsets as required to clear piping and ductwork.

- D. Install centerline of switch outlet boxes 48" above floor unless otherwise called for or required by Wainscot, counter, etc. All electrical light switches shall be located as close to door frame as possible. Under no circumstances should switch be located more than 12' from edge of door frame. Install centerline of receptacle outlet boxes 18" above floor unless otherwise called for on drawings. Adjust mounting heights to nearest masonry joint for minimum cutting in case of flush outlets. All thermostats shall be centered above light switches wherever possible. If switch outlet is shown to be installed in or on a column, switch outlet shall be centered on column.
- E. Install clock and other outlet boxes at elevations indicated on drawings or as directed by A/E. Center bracket lights over mirrors with 2" clearance above mirror.

END OF SECTION 261300

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SECTION 264410 - SWITCHBOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections, section 260100 - General Electrical Requirements, and section 260500 - Basic Electrical Materials and Methods shall apply to this Section.

1.2 SECTION INCLUDES

- A. Main Switchboard - Furnish and install the Service Entrance switchboard(s) as herein specified and shown on the associated electrical drawings.
- B. Distribution Switchboard - Furnish and install the Distribution Switchboard(s) as herein specified and shown on the associated electrical drawings.

1.3 REFERENCES

- A. The switchboard(s) and overcurrent protection devices referenced herein are designed and manufactured according to the following appropriate specifications.
 - 1. ANSI/NFPA 70 - National Electrical Code (NEC).
 - 2. ANSI/IEEE C12.16 - Solid State Electricity Metering.
 - 3. ANSI C57.13 - Instrument Transformers.
 - 4. NEMA AB 1 - Molded Case Circuit Breakers and Molded Case Switches.
 - 5. NEMA PB 2 - Deadfront Distribution Switchboards, File E8681
 - 6. NEMA PB 2.1 - Proper Handling, Installation, Operation and Maintenance of Deadfront Switchboards Rated 600 Volts or Less.
 - 7. NEMA PB 2.2 - Application Guide for Ground Fault Protective Devices for Equipment.
 - 8. UL 50 - Cabinets and Boxes.
 - 9. UL 489 - Molded Case Circuit Breakers.
 - 10. UL 891 - Dead-Front Switchboards.
 - 11. UL 943 - Ground Fault Circuit Interrupters.
 - 12. Federal Specification W-C-375B/Gen - Circuit Breakers, Molded Case, Branch Circuit And Service.

1.4 SUBMITTALS

- A. Shop Drawings shall indicate front and side enclosure elevations with overall dimensions shown; conduit entrance locations and requirements; nameplate legends; one-line diagrams; equipment schedule; and switchboard instrument details.

1.5 QUALIFICATIONS

- A. To be considered for approval, a manufacturer shall have specialized in the manufacturing and assembly of switchboards for at least fifty (50) years.
- B. Furnish products listed by Underwriters Laboratories Incorporated and in accordance with standards listed in Article 1.03 - References.

- C. The manufacturing facility shall be registered by Underwriters Laboratories Inc. to the International Organization for Standardization ISO 9002 Series Standards for quality.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect, and handle products in conformance with manufacturer's recommended practices as outlined in applicable Installation and Maintenance Manuals.
- B. Each switchboard section shall be delivered in individual shipping splits for ease of handling. They shall be individually wrapped for protection and mounted on shipping skids.
- C. Inspect and report concealed damage to carrier within their required time period.
- D. Store in a clean, dry space. Maintain factory protection and/or provide an additional heavy canvas or heavy plastic cover to protect structure from dirt, water, construction debris, and traffic. Where applicable, provide adequate heating within enclosures to prevent condensation.
- E. Handle in accordance with NEMA PB 2.1 and manufacturer's written instructions. Lift only by lifting means provided for this express purpose. Handle carefully to avoid damage to switchboard internal components, enclosure, and finish.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Conform to NEMA PB 2 service conditions during and after installation of switchboards.

1.8 MAINTENANCE MATERIALS

- A. Provide one (1) set of installation and maintenance instructions with each switchboard. Instructions are to be easily identified and affixed within the incoming or main section of the line-up.

1.9 WARRANTY

- A. Manufacturer shall warrant equipment to be free from defects in materials and workmanship for the lesser of one (1) year from date of installation or eighteen (18) months from date of purchase.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Shall be Square D Company.
- B. Equivalent by Eaton, General Electric and Seimens.

2.2 SWITCHBOARD - GENERAL

- A. Future Provisions: All unused spaces provided, unless otherwise specified, shall be fully equipped for future devices, including all appropriate connectors and mounting hardware.
- B. Enclosure:
 - 1. Sections shall be aligned front and rear.
 - 2. Removable steel base channels (1.5 inch floor sills) shall be bolted to the frame to rigidly support the entire shipping section for moving on rollers and floor mounting.
 - 3. The switchboard enclosure shall be painted on all exterior surfaces. The paint finish shall be a medium gray, ANSI #49, applied by the electro-deposition process over an iron phosphate pre-treatment.

4. All front covers shall be screw removable with a single tool and all doors shall be hinged with removable hinge pins.
 5. Top and bottom conduit areas shall be clearly indicated on shop drawings.
- C. Nameplates: Provide 1 inch high x 3 inches engraved laminated (Gravoply) nameplates for each device. Furnish black letters on a white background for all voltages.
- D. Bus Composition: Shall be tin-plated aluminum. Plating shall be applied continuously to all bus work. The switchboard bussing shall be of sufficient cross-sectional area to meet UL Standard 891 temperature rise requirements. The phase and neutral through-bus shall have an ampacity as shown in the plans. For 4-wire systems, the neutral shall be of equivalent ampacity as the phase bus bar. Tapered bus is not acceptable. Full provisions for the addition of future sections shall be provided. Bussing shall include all necessary hardware to accommodate splicing for future additions.
- E. Ground Bus: Sized per NFPA70 and UL 891 Tables 25.1 and 25.2 and shall extend the entire length of the switchboard. Provisions for the addition of future sections shall be provided.

2.3 SWITCHBOARD - INCOMING MAIN SECTION DEVICES

- A. Six (6) Service Disconnects
1. Incoming conductors shall terminate at lug landing pads.
 2. All lugs shall be UL Listed to accept solid and/or stranded copper and aluminum conductors. Lugs shall be suitable for 75° C rated wire, sized according to the 75° C temperature rating in the NEC.
 3. Provide mechanical type lugs to accommodate the conductor shown on the associated drawings.
- B. Group mounted circuit breakers through 1200A
1. Circuit breaker(s) shall be group mounted plug-on with mechanical restraint on a common pan or rail assembly.
 2. The interior shall have three flat bus bars stacked and aligned vertically with glass reinforced polyester insulators laminated between phases. The molded polyester insulators shall support and provide phase isolation to the entire length of bus.
 3. Circuit breaker(s) equipped with line terminal jaws shall not require additional external mounting hardware. Circuit breaker(s) shall be held in mounted position by a self-contained bracket secured to the mounting pan by fasteners. Circuit breaker(s) of different frame sizes shall be capable of being mounted across from each other.
 4. Line-side circuit breaker connections are to be jaw type.
 5. All unused spaces provided, unless otherwise specified, shall be fully equipped for future devices, including all appropriate connectors and mounting hardware.
 6. Electronic trip molded case standard function 80% rated circuit breakers through 1200A
 - a. All electronic circuit breakers shall have the following time/current response adjustments: Long Time Pickup, Long Time Delay, Short Time Pickup, Short Time Delay, and Instantaneous settings. Each adjustment shall have discrete settings (fully adjustable) and shall be independent of all other adjustments.
 - b. Circuit breaker trip system shall be a microprocessor-based true rms sensing designed with sensing accuracy through the thirteenth (13th) harmonic. Sensor ampere ratings shall be as indicated on the associated [schedule] [drawing].
 - c. Long Time Pickup indication to signal when loading approaches or exceeds the adjustable ampere rating of the circuit breaker shall be provided.

- d. Furnish thermal magnetic molded case circuit breakers for 250A frames and below.
- 7. Thermal magnetic molded case circuit breakers through 250A
 - a. Molded case circuit breakers shall have integral thermal and instantaneous magnetic trip in each pole.
 - b. Circuit protective devices shall be Square D molded case circuit breaker(s). Ampere ratings shall be as shown on the drawings.
 - c. Manufacturer shall submit one set of published I_p and I^2t let-through curves (as required by UL) to the owner.
- C. Individually Mounted circuit breakers through 4000A
 - 1. Electronic trip molded/insulated case full function 100% rated circuit breaker(s) through 4000A
 - a. All electronic circuit breakers shall have the following time/current response adjustments: Long Time Pickup, Long Time Delay, Short Time Pickup, Short Time Delay, and Instantaneous settings. Each adjustment shall have discrete settings (fully adjustable) and shall be independent of all other adjustments.
 - b. Circuit breaker trip system shall be a microprocessor-based true rms sensing designed with sensing accuracy through the thirteenth (13th) harmonic.
 - c. Local visual trip indication for overload, short circuit and ground fault trip occurrences.
 - d. Long Time Pickup indication to signal when loading approaches or exceeds the adjustable ampere rating of the circuit breaker shall be provided.
 - e. Manufacturer shall submit one set of published I_p and I^2t let-through curves (as required by UL) to the owner.

2.4 ACCESSORIES

- A. For switchboards installed outdoor only, provide thermostatically-controlled electric heaters in each section. [Provide terminals for separate source connection of heater power circuit. Voltage Rating: 120 V. Provide control power transformer with the total VA rating of the electric heaters in the switchboard.
- B. Provide integral PowerLogic ION6200 meter.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine area to receive switchboard to provide adequate clearance for switchboard installation.
- B. Check that concrete pads are level and free of irregularities.
- C. Start work only after unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Install switchboard in accordance with manufacturer's written guidelines, the NEC, and local codes.

3.3 FIELD QUALITY CONTROL

- A. Inspect completed installation for physical damage, proper alignment, anchorage, and grounding.

- B. Measure, using a Megger, the insulation resistance of each bus section phase-to-phase and phase-to-ground for one minute each, at minimum test voltage of 1000 VDC; minimum acceptable value for insulation resistance is 1 megohms. NOTE: Refer to manufacturer's literature for specific testing procedures.
- C. Check tightness of accessible bolted bus joints using calibrated torque wrench per manufacturer's recommended torque values.
- D. Physically test key interlock systems to check for proper functionality.
- E. Test ground fault systems by operating push-to-test button.

3.4 ADJUSTING

- A. Adjust all operating mechanisms for free mechanical movement per manufacturers specifications.
- B. Tighten bolted bus connections in accordance with manufacturer's instructions.
- C. Adjust circuit breaker trip and time delay settings to values indicated.
- D. Provide selective coordination study of complete electrical distribution system and submit to engineer for review and approval.

3.5 CLEANING

- A. Touch up scratched or marred surfaces to match original finish.

END OF SECTION 264410

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SECTION 264420 - PANELBOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections, section 260100 - General Electrical Requirements, and section 260500 - Basic Electrical Materials and Methods shall apply to this Section.

1.2 SECTION INCLUDES

- A. Lighting and Appliance Panelboard - Furnish and install lighting and appliance panelboard(s) as specified herein and where shown on the associated schedules on the construction drawings.

1.3 REFERENCES

- A. The panelboard(s) and circuit breaker(s) referenced herein are designed and manufactured according to the latest revision of the following specifications.
 1. NEMA PB 1 - Panelboards
 2. NEMA PB 1.1 - Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.
 3. NEMA AB 1 - Molded Case Circuit Breakers
 4. UL 50 - Enclosures for Electrical Equipment
 5. UL 67 - Panelboards
 6. UL 489 - Molded-Case Circuit Breakers and Circuit Breaker Enclosures
 7. CSA Standard C22.2 No. 29-M1989 - Panelboards and Enclosed Panelboards
 8. CSA Standard C22.2 No. 5-M91 - Molded Case Circuit Breakers
 9. Federal Specification W-P-115C - Type I Class 1
 10. Federal Specification W-C-375B/Gen - Circuit Breakers, Molded Case, Branch Circuit And Service.
 11. NFPA 70 - National Electrical Code (NEC)
 12. ASTM - American Society of Testing Materials

1.4 SUBMITTAL AND RECORD DOCUMENTATION

- A. Approval documents shall include drawings. Drawings shall contain overall panelboard dimensions, interior mounting dimensions, and wiring gutter dimensions. The location of the main, branches, and solid neutral shall be clearly shown. In addition, the drawing shall illustrate one line diagrams with applicable voltage systems.

1.5 QUALIFICATIONS

- A. Company specializing in manufacturing of panelboard products with a minimum of fifty (50) years documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Inspect and report concealed damage to carrier within their required time period.
- B. Handle carefully to avoid damage to panelboard internal components, enclosure, and finish.

- C. Store in a clean, dry environment. Maintain factory packaging and, if required, provide an additional heavy canvas or heavy plastic cover to protect enclosure(s) from dirt, water, construction debris, and traffic.

1.7 OPERATIONS AND MAINTENANCE MATERIALS

- A. Manufacturer shall provide installation instructions and NEMA Standards Publication PB 1.1 - Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.

1.8 WARRANTY

- A. Manufacturer shall warrant specified equipment free from defects in materials and workmanship for the lesser of one (1) year from the date of installation or eighteen (18) months from the date of purchase.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Shall be Square D Company
- B. Equivalent by Eaton, General Electric and Seimens.

2.2 POWER DISTRIBUTION PANELBOARDS

- A. I-LINE Circuit Breaker Distribution Panelboard
 - 1. Interior
 - a. Shall be Square D I-LINE type rated 600 Vac or 250 Vdc maximum. Continuous main current ratings as indicated on associated schedules on the construction drawings not to exceed 1200 amperes maximum. Panelboard bus current ratings shall be determined by heat-rise tests conducted in accordance with UL 67.
 - b. Provide UL Listed short circuit current ratings (SCCR) as indicated on the associated schedules on the construction drawings not to exceed the lowest interrupting capacity rating of any circuit breaker installed with a maximum of 200,000 RMS symmetrical amperes. Main lug and main breaker panelboards shall be suitable for use as Service Equipment when application requirements comply with UL 67 and NEC Articles 230.VI and VII.
 - c. The panelboard interior shall have three flat bus bars stacked and aligned vertically with glass reinforced polyester insulators laminated between phases. The molded polyester insulators shall support and provide phase isolation to the entire length of bus.
 - d. The bussing shall be fully rated with sequentially phased branch distribution. Panelboard bussing rated 100 through 600 amperes shall be plated copper. Bussing rated 800 amperes and above shall be plated copper. Bus bar plating shall run the entire length of the bus bar. The entire interleaved assembly shall be contained between two (2) U-shaped steel channels, permanently secured to a galvanized steel-mounting pan by fasteners.
 - e. Interior trim shall be of dead-front construction to shield user from all energized parts. Main circuit breakers through 800 amperes shall be vertically mounted. Main circuit breaker and main lug interiors shall be field convertible for top or bottom incoming feed.
 - f. A solidly bonded copper equipment ground bar shall be provided.

- g. Solid neutral shall be equipped with a full capacity bonding strap for service entrance applications. Gutter-mounted neutral will not be acceptable.
- h. Nameplates shall contain system information and catalog number or factory order number. Interior wiring diagram, neutral wiring diagram, UL Listed label, and Short Circuit Current Rating shall be displayed on the interior or in a booklet format. Leveling provisions shall be provided for flush mounted applications.
- 2. Group mounted circuit breakers through 1200A
 - a. Circuit breaker(s) shall be group mounted plug-on with mechanical restraint on a common pan or rail assembly.
 - b. The interior shall have three flat bus bars stacked and aligned vertically with glass reinforced polyester insulators laminated between phases. The molded polyester insulators shall support and provide phase isolation to the entire length of bus.
 - c. Circuit breakers equipped with line terminal jaws shall not require additional external mounting hardware. Circuit breakers shall be held in mounted position by a self-contained bracket secured to the mounting pan by fasteners. Circuit breakers of different frame sizes shall be capable of being mounted across from each other.
 - d. Line-side circuit breaker connections are to be jaw type.
 - e. All unused spaces provided, unless otherwise specified, shall be fully equipped for future devices, including all appropriate connectors and mounting hardware.
- 3. Thermal magnetic molded case circuit breakers
 - a. Molded case circuit breakers shall have integral thermal and instantaneous magnetic trip in each pole.
 - b. Circuit protective devices shall be Square D molded case circuit breakers. Circuit breakers shall be standard interrupting. Ampere ratings shall be as shown on the drawings. Manufacturer shall submit one set of published I_p and I^2t let-through curves (as required by UL) to the owner.
- 4. Enclosures
 - a. Type 1 Boxes
 - 1) Boxes shall be galvanized steel constructed in accordance with UL 50 requirements. Zinc-coated galvanized steel will not be acceptable.
 - 2) Boxes shall have removable blank end walls and interior mounting studs. Interior support bracket shall be provided for ease of interior installation.
 - 3) Maximum enclosure dimensions shall be 44" wide and 9.5" deep.
 - b. Type 1 Trim Fronts
 - 1) Trim front steel shall meet strength and rigidity requirements per UL 50 standards. Shall have an ANSI 49 medium gray enamel electrodeposited over cleaned phosphatized steel.
 - 2) Trim front shall be hinged 1-piece with door available in surface mount. Trim front door shall have rounded corners and edges free of burrs. A clear plastic directory cardholder shall be mounted on the inside of the door.
 - 3) Locks shall be cylindrical tumbler type with larger enclosures requiring sliding vault locks with 3-point latching. All lock assemblies shall be keyed alike. One (1) key shall be provided with each lock.

2.3 LIGHTING AND APPLIANCE PANELBOARD TYPE

- A. NQ
 - 1. Interior
 - a. Shall be type NQ panelboard rated for 240 Vac/48 Vdc maximum. Continuous main current ratings, as indicated on associated schedules on the construction drawings. not to exceed 600 amperes maximum.
 - b. Minimum short circuit current rating: as indicated in schedules on the construction drawings.

- c. Short circuit current rating: [5,000] at 48 Vdc.
 - d. Provide one (1) continuous bus bar per phase. Each bus bar shall have sequentially phased branch circuit connectors suitable for plug-on or bolt-on branch circuit breakers. The bussing shall be fully rated. Panelboard bus current ratings shall be determined by heat-rise tests conducted in accordance with UL 67. Bussing rated 100-400 amperes shall be plated copper. Bussing rated for 600 amperes shall be plated copper as standard construction. Bus bar plating shall run the entire length of the bus bar. Panelboards shall be suitable for use as Service Equipment when application requirements comply with UL 67 and NEC Articles 230-F and -G.
 - e. All current-carrying parts shall be insulated from ground and phase-to-phase by high dielectric strength thermoplastic.
 - f. A solidly bonded copper equipment ground bar shall be provided.
 - g. Split solid neutral shall be plated and located in the mains compartment up to 225 amperes so all incoming neutral cable may be of the same length.
 - h. Interior trim shall be of dead-front construction to shield user from energized parts. Dead-front trim shall have pre-formed twistouts covering unused mounting space.
 - i. Nameplates shall contain system information and catalog number or factory order number. Interior wiring diagram, neutral wiring diagram, UL Listed label and short circuit current rating shall be displayed on the interior or in a booklet format.
 - j. Interiors shall be field convertible for top or bottom incoming feed. Main circuit breakers in 100A interiors shall be vertically mounted. Main circuit breakers over 100A shall be vertically mounted. Sub-feed circuit breakers shall be vertically mounted. Main lug interiors up to 400 amperes shall be field convertible to main breaker. Interior leveling provisions shall be provided for flush mounted applications.
2. Main Circuit Breaker
- a. Shall be Square D type circuit breakers.
 - b. Main circuit breakers shall have an overcenter, trip-free, toggle mechanism which will provide quick-make, quick-break contact action. Circuit breakers shall have a permanent trip unit with thermal and magnetic trip elements in each pole. Each thermal element shall be true rms sensing and be factory calibrated to operate in a 40° C ambient environment. Thermal elements shall be ambient compensating above 40° C.
 - c. Two- and three-pole circuit breakers shall have common tripping of all poles. Circuit breakers frame sizes above 100 amperes shall have a single magnetic trip adjustment located on the front of the circuit breaker that allows the user to simultaneously select the desired trip level of all poles. Circuit breakers shall have a push-to-trip button for maintenance and testing purposes.
 - d. Breaker handle and faceplate shall indicate rated ampacity. Standard construction circuit breakers shall be UL Listed for reverse connection without restrictive line or load markings.
 - e. Circuit breaker escutcheon shall have international I/O markings, in addition to standard ON/OFF markings. Circuit breaker handle accessories shall provide provisions for locking handle in the ON or OFF position.
 - f. Lugs shall be UL Listed to accept solid or stranded copper conductors only. Lugs shall be suitable for 75° C rated wire sized according to the 75° C temperature rating per NEC Table 310-16. Lug body shall be bolted in place; snap-in designs are not acceptable.
 - g. The circuit breakers shall be UL Listed for use with the following accessories: Shunt Trip, Under Voltage Trip, Ground Fault Shunt Trip, Auxiliary Switch, Alarm Switch, Mechanical Lug Kits, and Compression Lug Kits.
3. Branch Circuit Breakers

- a. Shall be Square D type circuit breakers. Circuit breakers shall be UL Listed with amperage ratings, interrupting ratings, and number of poles as indicated on the associated schedules on the construction drawings.
 - b. Molded case branch circuit breakers shall have bolt-on type bus connectors.
 - c. Circuit breakers shall have an overcenter toggle mechanism which will provide quick-make, quick-break contact action. Circuit breakers shall have thermal and magnetic trip elements in each pole. Two- and three-pole circuit breakers shall have common tripping of all poles.
 - d. There shall be two forms of visible trip indication. The breaker handle shall reside in a position between ON and OFF. In addition, there shall be a red VISI-TRIP® indicator appearing in the clear window of the circuit breaker housing.
 - e. The exposed faceplates of all branch circuit breakers shall be flush with one another.
 - f. Lugs shall be UL Listed to accept solid or stranded copper copper conductors only. Lugs shall be suitable for 75° C rated wire, sized according to the 75° C temperature rating per NEC Table 310-16. Branch circuit breakers rated 30 amperes and below shall be UL Listed to accept 60° C rated wire.
 - g. Breakers shall be UL Listed for use with the following factory installed accessories: Shunt Trip, Auxiliary Switch, and Alarm Switch.
4. Enclosures
- a. Type 1 Boxes
 - 1) Boxes shall be galvanized steel constructed in accordance with UL 50 requirements. Galvannealed steel will not be acceptable.
 - 2) Boxes shall have removable endwalls with knockouts located on one end. Boxes shall have welded interior mounting studs. Interior mounting brackets are not required.
 - 3) Box width shall be 26" wide maximum wide.
 - b. Type 1 Fronts
 - 1) Front shall meet strength and rigidity requirements per UL 50 standards. Front shall have ANSI 49 gray enamel electrodeposited over cleaned phosphatized steel.
 - 2) Fronts shall be hinged 1-piece with door. Mounting shall be as indicated on drawings and associated schedules.
 - 3) Panelboards shall have MONO-FLAT fronts with concealed door hinges and mounted with trim screws. Front shall not be removable with the door locked. Doors on front shall have rounded corners and edges shall be free of burrs.
 - 4) Front shall have cylindrical tumbler type lock with catch and spring-loaded stainless steel door pull. All lock assemblies shall be keyed alike. One (1) key shall be provided with each lock. A clear plastic directory cardholder shall be mounted on the inside of door.
 - c. Type 3R, 5, and 12
 - 1) Enclosures shall be constructed in accordance with UL 50 requirements. Enclosures shall be painted with ANSI 49 gray enamel electrodeposited over cleaned phosphatized steel.
 - 2) All doors shall be gasketed and equipped with a tumbler type vault lock and two (2) additional quarter turn fasteners on enclosures 59 inches or more in height. All lock assemblies shall be keyed alike. One (1) key shall be provided with each lock. A clear plastic directory cardholder shall be mounted on the inside of door.
 - 3) Maximum enclosure dimensions shall not exceed 21" wide and 6.5" deep.
- B. NF
- 1. Interior

- a. Shall be type NF panelboard for 480Y/277 Vac maximum. Continuous main current ratings, as indicated on associated schedules and drawings, not to exceed 600 amperes maximum for main breaker panelboards and not to exceed 800 amperes for main lug panelboards.
 - b. Minimum Short Circuit Rating as listed on schedule at 480Y/277 Vac.
 - c. Provide one (1) continuous bus bar per phase. Each bus bar shall have sequentially phased branch circuit connectors limited to bolt-on branch circuit breakers. The bussing shall be fully rated. Panelboard bus current ratings shall be determined by heat-rise tests conducted in accordance with UL 67. Bussing rated 100-400 amperes shall be plated [copper] [aluminum]. Bussing rated for 600 and 800 amperes shall be plated copper as standard construction. Bus bar plating shall run the entire length of the bus bar. Panelboards shall be suitable for use as Service Equipment when application requirements comply with UL 67 and NEC Articles 230-F and -G.
 - d. All current-carrying parts shall be insulated from ground and phase-to-phase by high dielectric strength thermoplastic.
 - e. A solidly bonded copper equipment ground bar shall be provided.
 - f. Split solid neutral shall be plated and located in the mains compartment up to 250 amperes so all incoming neutral cable may be of the same length.
 - g. Interior trim shall be of dead-front construction to shield user from energized parts. Dead-front trim shall have pre-formed twistouts covering unused mounting space.
 - h. Nameplates shall contain system information and catalog number or factory order number. Interior wiring diagram, neutral wiring diagram, UL Listed label and short circuit current rating shall be displayed on the interior or in a booklet format.
 - i. Interiors shall be field convertible for top or bottom incoming feed. Main circuit breakers in 125A interiors shall be vertically mounted. Main circuit breakers over 125A shall be vertically mounted. Sub-feed circuit breakers shall be vertically mounted. Main lug interiors up to 400 amperes shall be field convertible to main breaker. Interior leveling provisions shall be provided for flush mounted applications.
 - j. Interior phase bus shall be pre-drilled to accommodate field installable options. (i.e., Sub-Feed Lugs, Sub-Feed Breakers, Thru-Feed Lugs)
 - k. Interiors shall accept 125 ampere breakers in group mounted branch construction.
2. Main Circuit Breaker
- a. Shall be Square D type circuit breakers.
 - b. Main circuit breakers shall have an overcenter, trip-free, toggle mechanism which will provide quick-make, quick-break contact action. Circuit breakers shall have a permanent trip unit with thermal and magnetic trip elements in each pole. Each thermal element shall be true rms sensing and be factory calibrated to operate in a 40° C ambient environment. Thermal elements shall be ambient compensating above 40° C.
 - c. Two- and three-pole circuit breakers shall have common tripping of all poles. Circuit breakers frame sizes above 100 amperes shall have a single magnetic trip adjustment located on the front of the breaker that allows the user to simultaneously select the desired trip level of all poles. Circuit breakers shall have a push-to-trip button for maintenance and testing purposes.
 - d. Circuit breaker handle and faceplate shall indicate rated ampacity. Standard construction circuit breakers shall be UL Listed for reverse connection without restrictive line or load markings.
 - e. Circuit breaker escutcheon shall have international I/O markings, in addition to standard ON/OFF markings. Circuit breaker handle accessories shall provide provisions for locking handle in the ON or OFF position.

- f. Lugs shall be UL Listed to accept solid or stranded copper conductors only. Lugs shall be suitable for 75° C rated wire. Lug body shall be bolted in place; snap-in designs are not acceptable.
 - g. The circuit breakers shall be UL Listed for use with the following accessories: Shunt Trip, Under Voltage Trip, Ground Fault Shunt Trip, Auxiliary Switch, Alarm Switch, Mechanical Lug Kits, and Compression Lug Kits.
3. Branch Circuit Breakers
- a. Shall be Square D type circuit breakers. Circuit breakers shall be UL Listed with ampere ratings, interrupting ratings, and number of poles as indicated on the panelboard schedules.
 - b. Molded case branch circuit breakers shall have bolt-on type bus connectors.
 - c. Circuit breakers shall have an overcenter toggle mechanism which will provide quick-make, quick-break contact action. Circuit breakers shall have thermal and magnetic trip elements in each pole. Two- and three-pole circuit breakers shall have common tripping of all poles.
 - d. There shall be two forms of visible trip indication. The circuit breaker handle shall reside in a position between ON and OFF. In addition, there shall be a red VISI-TRIP® indicator appearing in the clear window of the circuit breaker housing.
 - e. The exposed faceplates of all branch circuit breakers shall be flush with one another.
 - f. Lugs shall be UL Listed to accept solid or stranded copper conductors only. Lugs shall be suitable for 75° C rated wire.
 - g. Breakers shall be UL Listed for use with the following factory installed accessories: Shunt Trip, Auxiliary Switch, and Alarm Switch.
 - h. Breaker shall be UL Listed with the following ratings: (15-125A) Heating, Air Conditioning, and Refrigeration (HACR), (15-30A) High Intensity Discharge (HID), and (15-20A) Switch Duty (SWD)
4. Enclosures
- a. Type 1 Boxes
 - 1) Boxes shall be galvanized steel constructed in accordance with UL 50 requirements. Galvannealed steel will not be acceptable.
 - 2) Boxes shall have removable endwalls with knockouts located on one end. Boxes shall have welded interior mounting studs. Interior mounting brackets are not required.
 - 3) Box width shall not exceed 26" wide.
 - b. Type 1 Fronts
 - 1) Front shall meet strength and rigidity requirements per UL 50 standards. Shall have ANSI 49 gray enamel electrodeposited over cleaned phosphatized steel.
 - 2) Fronts shall be 1-piece with door. Mounting shall be as indicated on associated schedules/drawings.
 - 3) Panelboards rated 250 amperes and below shall have MONO-FLAT fronts with concealed door hinges and trim screws. Front shall not be removable with the door locked. Panelboards rated above 250 amperes shall have vented fronts with concealed door hinges. Doors on front shall have rounded corners; edges shall be free of burrs.
 - 4) Front shall have flat latch type lock with catch and spring loaded stainless steel door pull. All lock assemblies shall be keyed alike. One (1) key shall be provided with each lock. A clear plastic directory card holder shall be mounted on the inside of door.
 - c. Type 3R, 5, and 12
 - 1) Enclosures shall be constructed in accordance with UL 50 requirements. Enclosures shall be painted with ANSI 49 gray enamel electrodeposited over cleaned phosphatized steel.

- 2) All doors shall be gasketed and equipped with a tumbler type vault lock and two (2) additional quarter turn fasteners on enclosures 59 inches or more in height. All lock assemblies shall be keyed alike. One (1) key shall be provided with each lock. A clear plastic directory card holder shall be mounted on the inside of door.
- 3) Maximum enclosure dimensions shall not exceed 21” wide and 9.5” deep.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install panelboards in accordance with manufacturer's written instructions, NEMA PB 1.1 and NEC standards.
- B. Mounting height shall be in accordance of NEC standards.

3.2 FIELD QUALITY CONTROL

- A. Inspect complete installation for physical damage, proper alignment, anchorage, and grounding.
- B. Measure steady state load currents at each panelboard feeder; rearrange circuits in the panelboard to balance the phase loads within 20% of each other. Maintain proper phasing for multi-wire branch circuits.
- C. Check tightness of bolted connections and circuit breaker connections using calibrated torque wrench or torque screwdriver per manufacturer's written specifications.

END OF SECTION 264420

SECTION 311000 - SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Cleaning site of debris, grass, trees, and other plant life in preparation for site or building earthwork.
 - 2. Protection of existing structures, trees, or vegetation indicated on the Construction Drawings to remain.

1.2 ENVIRONMENTAL REQUIREMENTS

- A. Construct temporary erosion control systems as shown on Construction Drawings to protect adjacent properties and water resources from erosion and sedimentation, or as directed by Owner, Engineer, or local or state authority.
- B. In event that sitework on this project will disturb 1 or more acres; Contractor shall not begin construction without “National Pollution Discharge Elimination System” (NPDES) permit governing discharge of storm water from site for entire construction period. NPDES permit requires SWPPP to be in place during construction.
- C. Contractor shall conduct storm water management practices in accordance with NPDES permit and shall enforce action taken or imposed by Federal or State agencies, including cost of fines, construction delays, and remedial actions resulting from Contractor’s failure to comply with provisions of NPDES permit.

1.3 PROJECT CONDITIONS

- A. Conditions existing at time of inspection for bidding purposes will be maintained by Owner as reasonably practical.
- B. Access to adjacent properties by driveway/roadway will be maintained at all times during demolition, clearing, and construction.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION

3.1 PREPARATION

- A. Identify existing plant life that is to remain and verify clearing limits are clearly tagged, identified, and marked in such manner as to ensure their protection throughout construction operations.

3.2 PROTECTION

- A. Locate, identify, and protect existing utilities that are to remain.
- B. Protect trees, plant growth, and features designated to remain as part of final landscaping.
- C. Conduct operations with minimum interference to public or private accesses and facilities. Maintain ingress and egress at all times and clean or sweep roadways daily as required by governing authority. Dust control shall be provided with sprinkling systems of equipment provided by Contractor.
- D. Protect benchmarks, property corners, and other survey monuments from damage or displacement. If marker needs to be removed it shall be referenced by a licensed land surveyor and replaced, as necessary, in kind.
- E. Provide traffic control as required, in accordance with the US Department of Transportation's "Manual on Uniform Traffic Control Devices" and applicable state highway department requirements.

3.3 EQUIPMENT

- A. Material shall be transported to and from the project site using well-maintained and operating vehicles. Transporting vehicles operating on site shall stay on designated haul roads and shall not endanger improvements by rutting, overloading, or pumping.

3.4 CLEARING

- A. Clear areas required for access to site and execution of work.
- B. Unless otherwise indicated on Construction Drawings, remove trees, shrubs, grass, other vegetation, improvements, or obstructions interfering with installation of new construction. Removal includes digging out stumps and roots. Depressions caused by clearing and grubbing operations shall be filled to subgrade elevation to avoid ponding of water. Satisfactory fill material shall be placed in accordance with the Earthwork section.
- C. All hardwood vegetation (trees) is to be chipped or mulched and disposed of at a site suitable for handling such material according to state law and regulations.
- D. Remove grass, plant life, stumps, and other construction debris from site to dump site that is suitable for handling such material according to state laws and regulations.
- E. Cut heavy growths of grass from areas before stripping and topsoil removal and remove cuttings with remainder of cleared vegetative material.

END OF SECTION 311000

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SECTION 312000 - EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Trenching and backfilling for utilities.
 - 2. Dewatering.

1.2 QUALITY ASSURANCE

- A. An Independent Testing Laboratory (ITL), selected and paid for by the Owner, will be retained to perform construction testing on site.
 - 1. The ITL shall prepare test reports that indicate test location, elevation data, and test results. Owner, Engineer, and Contractor shall be provided with copies of reports within 96 hours of time that test was performed. In event that test performed fails to meet Specifications, the independent testing laboratory shall notify Owner and Contractor immediately.
 - 2. Costs related to retesting due to failures shall be paid for by the Contractor at no additional expense to Owner. Contractor shall provide free access to site for testing activities.
 - 3. Quality assurance testing will be conducted in accordance with Paragraph "Field Testing" in Part 3 hereinafter.

1.3 DEFINITIONS

- A. Satisfactory Materials: ASTM D 2487 soil classification groups GW, SW, SP, SM, ML, CL, or a combination of these group symbols.
 - 1. Fill material shall further conform to the plasticity index and liquid limits (PI and LL) specified in Paragraph FILLING hereinafter.
 - 2. Satisfactory materials shall contain no debris, waste, frozen materials, vegetation, and other deleterious matter.
 - 3. The following table stipulates maximum allowable values for plasticity index (PI) and liquid limit (LL) of satisfactory materials to be used as fill in specified areas:

<u>Location with respect to subgrade</u>	<u>PI</u>	<u>LL</u>
Building area, upper 2 feet	20 max	45 max
Foundation bearing, upper 2 feet	20 max	45 max

- B. Unsatisfactory Materials: Materials which do not comply with the requirements for satisfactory materials are unsatisfactory.
 - 1. Unsatisfactory materials also include man-made fills; trash; refuse; backfills from previous construction; and material classified as satisfactory materials which contains root and other organic matter or frozen material. The ITL shall be notified of any contaminated materials.
 - 2. Unsatisfactory materials also include satisfactory materials not maintained within 2 percent of optimum moisture content at time of compaction.

C. Solid Rock: Solid Rock shall be as defined in Section 312100.

1.4 SUBMITTALS

- A. Submit name of each material supplier and specific type and source of each material. Change in source throughout project requires approval of Owner.
- B. Shop drawings or details pertaining to site utilities are not required unless required by regulatory authorities or unless uses of materials, methods, equipment, or procedures that are contrary to The Drawings or Specifications are proposed. Do not perform work until Owner has accepted required shop drawings.
- C. Submit certification that all material obtained from off-site sources complies with specification requirements.
- D. Shop drawings or details pertaining to excavating and filling are not required unless otherwise shown on the Drawings or if contrary procedures to Construction Documents are proposed.
- E. Contact utility companies and determine if additional easements will be required to complete project.

PART 2 - PRODUCTS

2.1 SOIL AND ROCK MATERIALS

- A. Trench Backfill: ASTM D 2321 unless otherwise specified or shown on the drawings.
- B. Bedding: Aggregate Type as indicated on the plans, or fine, clean, durable particles of sand or crushed stone. Crushed stone used for this purpose shall consist of materials passing a 1-inch sieve to dust.
- C. Fill and Backfill. Satisfactory materials excavated from the site.
- D. Imported Fill Material: Satisfactory material provided from offsite borrow areas when sufficient satisfactory materials are not available from required excavations.
- E. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2- inch sieve and 0 to 5 percent passing a No.8 sieve.
- F. Topsoil: Topsoil shall consist of stripping material excavated from the site. Topsoil shall consist of organic surficial soil found in depth of not more than 6-inches. Topsoil shall be as further defined in the specifications.

2.2 EQUIPMENT

- A. Transport off-site materials to project using well-maintained and operating vehicles. Once on site, transporting vehicles shall stay on designated haul roads and shall at no

time endanger improvements by rutting, overloading, or pumping.

2.3 SOURCE QUALITY CONTROL

- A. Following tests shall be performed on each type of on-site or imported soil material used as compacted fill:
 - 1. Moisture and Density Relationship: ASTM D 698 or ASTM D 1557.
 - 2. Mechanical Analysis: AASHTO T 88 or ASTM D422.
 - 3. Plasticity Index: ASTM D 4318.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Identify required lines, levels, contours, datum, elevations, and grades necessary for construction as shown on the drawings.
- B. Notify utility companies to remove or relocate public utilities that are in conflict with proposed improvements.
- C. Protect plant life, lawns, fences, existing structures, sidewalks, paving, and curbs, unless otherwise noted on the drawings from excavating equipment and vehicular traffic.
- D. Protect benchmarks, property corners, and other survey monuments from damage or displacement. If marker needs to be removed it shall be referenced by licensed land surveyor and replaced, as necessary, by same.
- E. Remove from site, material encountered in grading operations that, in opinion of Owner or the Owner's Independent Testing Laboratory (ITL) is unsatisfactory material or undesirable for backfilling, subgrade, or foundation purposes. Dispose of in manner satisfactory to Owner and local governing agencies. Backfill areas with layers of satisfactory material and compact as specified herein.
- F. Locate and identify utilities that have previously been installed and protect from damage.
- G. Locate and identify existing utilities that are to remain and protect from damage.
- H. Maintain in operating condition existing utilities, previously installed utilities, and drainage systems encountered in utility installation. Repair surface or subsurface improvements shown on The Drawings.
- I. Verify location, size, elevation, and other pertinent data required making connections to existing utilities and drainage systems as indicated on The Drawings.
- J. Over excavate and properly prepare areas of subgrade that are not capable of supporting proposed systems.

3.2 DEWATERING

A. General:

1. Maintain site using accepted and professional methods consistent with current industry practice to eliminate water entering the excavation under hydrostatic head from the bottom or sides. Design system to prevent differential hydrostatic head, which would result in floating out soil particles in a manner, termed as a “quick” or “boiling” condition. System shall not be dependent solely upon sumps or pumping water from within the excavation where differential head would result in a quick condition, which would continue to worsen the integrity of the excavation’s stability.
2. Maintain site to prevent ground and surface water flow into the excavation and to allow Work to be installed in a dry condition.
3. Control, by acceptable means, all water regardless of source. Contractor shall be responsible for disposal of the water.
4. Confine discharge piping or ditches to available easement or to additional easement obtained by Contractor. Provide necessary permits or easement.
5. Control groundwater in a manner that preserves strength of foundation soils, does not cause instability or raveling of excavation slopes, and does not result in damage to existing structures.
6. Commence dewatering prior to any appearance of water in excavation and continue until Work is complete to the extent that no damage results from hydrostatic pressure, flotation, or other causes.
7. Open pumping with sumps and ditches will be allowed provided it does not result in boils, loss of fines, softening of the ground, or instability of slopes.
8. Control grading around excavations to prevent surface water from flowing into excavation areas.
9. No additional payment will be made for any supplemental measures to control seepage, groundwater, or artesian head.

B. Damages:

1. Contractor shall be responsible for and shall repair any damage to work in place, other contractor’s equipment, utilities, residences, highways, roads, railroads, private and municipal well systems, adjacent structures, natural resources, habitat, existing wells, and the excavation. Contractor responsibility shall also include, damage to the bottom due to heave and including but not limited to, removal and pumping out of the excavated area that may result from Contractor’s negligence, inadequate or improper design and operation of the dewatering system, and any mechanical or electrical failure of the dewatering system.
2. Remove subgrade materials rendered unsatisfactory by excessive wetting and replace with approved backfill material at no additional cost to the Owner.

C. Maintaining Excavation in Dewatering Condition:

1. Dewatering shall be a continuous operation. Interruptions due to power outages, or any other reason will not be permitted.
2. Continuously maintain excavation in a dry condition with positive dewatering methods during preparation of subgrade, installation of pipe, and construction of structures until the critical period of construction or backfill is completed to prevent damage of subgrade support, piping, structure, side slopes, or adjacent facilities from flotation or other hydrostatic pressure imbalance.
3. Provide standby equipment on site, installed, wired, and available for immediate operation if required to maintain dewatering on a continuous basis in the event

any part of the system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, perform such work as may be required to restore damaged structures and foundation soils at no additional cost to Owner.

- D. System Removal: Upon completion of the work, remove dewatering equipment from the site, including related temporary electrical service.

3.3 TOPSOIL EXCAVATION

- A. Cut heavy growths of grass from areas before stripping and remove cuttings with remainder of cleared vegetative material.
- B. Strip topsoil to a depth of not less than 6 inches from areas that are to be filled, excavated, landscaped, or re-graded to such depth that it prevents intermingling with underlying subsoil or questionable material.
- C. Stockpile topsoil in storage piles in areas shown on The Drawings or where directed by Owner. Construct storage piles to freely drain surface water. Cover storage piles as required to prevent windblown dust. Dispose of unsuitable topsoil as specified for waste material, unless otherwise specified by Owner. Remove excess topsoil from site unless specifically noted otherwise on The Drawings.

3.4 GENERAL EXCAVATION

- A. Classification of Excavation:
 - 1. The contractor shall assure himself by site investigation or other necessary means that he is familiar with the type, quantity, quality, and character of excavation work to be performed. Excavation shall be considered Class "A" excavation, except as indicated in the Contract Documents.
 - 2. Solid Rock (Class "B") Excavation is specified in Section 312100.
- B. The decision of the Engineer shall be final in determining the classification of excavation.
- C. When performing grading operations during periods of wet weather, provide adequate dewatering, drainage and ground water management to control moisture of soils.
- D. Shore, brace, and drain excavations as necessary to maintain excavation as safe, secure, and free of water at all times.
- E. Place satisfactory excavated material into project fill areas.
- F. Unsatisfactory excavated material shall be disposed of in manner and location that is acceptable to Owner and local governing agencies.
- G. Perform excavation using capable, well-maintained equipment and methods acceptable to Owner and local governing agencies.

3.5 TRENCHING EXCAVATION FOR UTILITIES

- A. Contact local utility companies before excavation begins. Dig trench at proper width and depth for laying pipe, conduit, or cable. Cut trench banks vertical, if possible, and remove stones from bottom of trench as necessary to avoid point-bearing. Over-excavate wet or unstable soil, if encountered, from trench bottom as necessary to provide suitable base for continuous and uniform bedding. Replace over-excavation with satisfactory material and dispose of unsatisfactory material.
- B. Trench excavation sidewalls shall be sloped, shored, sheeted, braced, or otherwise supported by means of sufficient strength to protect workmen in accordance with applicable rules and regulations established for construction by the Department of Labor, Occupational Safety and Health Administration (OSHA), and by local ordinances. Lateral travel distance to exit ladder or steps shall not be greater than 25 feet in trenches 4 feet or deeper.
- C. Perform trench excavation as indicated on the Drawings for specified depths. During excavation, stockpile materials suitable for backfilling in orderly manner far enough from bank of trench to avoid overloading, slides, or cave-ins.
- D. Remove excavated materials not required or not satisfactory as backfill or embankments and waste off-site or at on-site locations approved by the Owner and in accordance with governing regulations. Dispose of structures discovered during excavation as specified in Site Demolition Section.
- E. Prevent surface water from flowing into trenches or other excavations by temporary grading or other methods, as required. Remove accumulated water in trenches and other excavations as specified.
- F. Open cut excavation with trenching machine or backhoe. Where machines other than ladder or wheel-type trenching machines are used, do not use clods for backfill.
- G. Accurately grade trench bottom to provide uniform bearing and support for each section of pipe on bedding material at every point along entire length except where necessary to excavate for bell holes, proper sealing of pipe joints, or other required connections. Dig bell holes and depressions for joints after trench bottom has been graded. Dig no deeper, longer, or wider than needed to make joint connection properly.
- H. Trench width below top of pipe shall not be wider than 1 and 4/10 (1.4) times the nominal diameter of the pipe plus twelve (12) inches; or as designated by the owner.
- I. Trench depth requirements measured from finished grade or paved surface shall meet the following requirements or applicable codes and ordinances, whichever is more stringent:
 - 1. Water Mains: 42 inches to top of pipe barrel or 6 inches below frost line, established by local building official, whichever is deeper.
 - 2. Storm Sewer: Elevations and grades as indicated on the Drawings.
 - 3. Electrical Conduits: 24 inches minimum to top of conduit or as required by NEC 300-5, NEC 710-36 codes, or local utility company requirements, whichever is deeper.

4. Telephone Conduits: 18 inches minimum to top of conduit, or as required by local utility company, whichever is deeper.

3.6 SUBGRADE PREPARATION

- A. Scarification and Compaction: Areas exposed by excavation or stripping and on which subgrade preparations are to be performed shall be scarified to minimum depth of 8 inches and compacted as specified hereinafter.
- B. Proofrolling: Subgrades shall be proofrolled to detect areas of insufficient compaction. Proofrolling shall be accomplished by making minimum of 2 complete passes with fully-loaded tandem-axle dump truck with a maximum weight of 20 tons, or approved equal, in each of 2 perpendicular directions while under the supervision and direction of the independent testing laboratory. Document and explain proofrolling inspection procedures and results in the laboratory inspection report. Areas of failure shall be excavated and recompacted as specified herein. Continual failure areas shall be properly stabilized. Subgrade exposed longer than 48 hours or on which precipitation has occurred shall be re-proofrolled.

3.7 PIPE BEDDING

- A. Excavate trenches for pipe or conduit according to Drawings. Place bedding material according to Drawings, compact in bottom of trench, and shape to conform to lower portion of pipe barrel.
- B. Place geotextile fabric as specified on the Drawings.

3.8 TRENCH BACKFILLING

- A. Materials used for trench backfill shall comply with requirements as specified herein.
- B. Backfill and compact in accordance with fill and compaction requirements in accordance with ASTM D 2321 unless otherwise shown on the drawings.
- C. Do not backfill trenches until required tests are performed and utility systems comply with and are accepted by applicable governing authorities.
- E. Backfill trenches to contours and elevations shown on the Drawings.
- F. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.

3.9 COMPACTION

- A. Compact as follows:

<u>Location</u>	<u>Percent of Maximum Laboratory Density ASTM D698</u>
Subgrade & Fill within 5 feet	95
Fills greater than 5 feet	95

- B. Maintain moisture content of not less than 2 percent below and not more than 3 percent above optimum moisture content of fill materials to attain required compaction density.
- C. Exercise proper caution when compacting immediately over top of pipes or conduits. Water jetting or flooding is not permitted as method of compaction.
- D. Corrective Measures for Non-Complying Compaction: Remove and recompact deficient areas until proper compaction is obtained. Continual failure areas shall be properly stabilized.

3.10 MAINTENANCE OF SUBGRADE

- A. Verify finished subgrades to ensure proper elevation and conditions for construction above subgrade.
- B. Protect subgrade from excessive wheel loading during construction, including concrete trucks, dump trucks, and other construction equipment.
- C. Remove areas of finished subgrade found to have insufficient compaction density to depth necessary and replace in manner that will comply with compaction requirements by use of material with CBR equal to or better than that specified on the drawings. Surface of subgrade after compaction shall be firm, uniform, smooth, stable, and true to grade and cross-section.
- D. Construct temporary ditches and perform such grading as necessary to maintain positive drainage away from subgrade at all times.

3.11 BORROW AND SPOIL SITES

- A. Comply with NPDES and local erosion control permitting requirements for any and all on-site and off-site, disturbed spoil and borrow areas. Upon completion of spoil or borrow operations, clean up spoil or borrow areas in a neat and reasonable manner to the satisfaction of Owner or off-site property owner, if applicable.

3.12 FINISH GRADING

- A. Grade areas where finish grade elevations or contours are indicated on the Drawings, other than paved areas, including excavated areas, filled and transition areas, and landscaped areas. Graded areas shall be uniform and smooth, free from rock, debris, or irregular surface changes. Ground surfaces shall vary uniformly between indicated elevations. Grade finished ditches to allow for proper drainage without ponding and in manner that will minimize erosion potential. For topsoil, sodding, and seeding requirements refer to Finish Grading and Seeding section.
- B. Correct settled and eroded areas within 1 year after date of completion at no additional expense to Owner. Bring grades to proper elevation.

3.13 QUALITY ASSURANCE TESTING AND INSPECTION

- A. Responsibilities: Unless otherwise specified, quality control tests and inspection specified below will be conducted by the Owner's Independent Testing Laboratory (ITL) at no cost to the Contractor. The Contractor shall perform additional testing or inspection as considered necessary by the Contractor for assurance of quality control.
- B. Field testing, frequency, and methods may vary as determined by and between the Owner and the ITL.
- C. Work shall be performed by Qualified Inspector. Report of testing and inspection results shall be made upon the completion of testing.
- D. Classification of Materials: Perform test for classification of materials used and encountered during construction in accordance with ASTM D2488 and ASTM D2487.
- E. Laboratory Testing Of Materials: Perform laboratory testing of materials (Proctor, Sieve Analysis, Atterberg Limits, Consolidation Test, etc.) as specified.
- F. Field Density Tests.
 - 1. Areas of Construction Exclusive of Building Subgrade Areas: In cut areas, not less than 1 compaction test for every 10,000 sq. ft. In fill areas, same rate of testing for each 8-inch lift, measured loose.
 - 2. Utility Trench Backfill: Intervals not exceeding 200-feet of trench for first and every other 8-inch lift of compacted trench backfill.
 - 3. Test Method: In-place nuclear density, ASTM D 2922 (Method B-Direct Transmission).
- G. Corrective Measures For Non-Complying Compaction: Remove and recompact deficient areas until proper compaction is obtained at no additional expense to Owner. Adjust moisture content as necessary to conform to the requirements of this section.
- H. Observation and Inspection:
 - 1. Observe all subgrades/excavation bases below footings and slabs and verify design bearing capacity is achieved as required. Work shall be performed by a Qualified Inspector.
 - 2. Observe and document presence of groundwater within excavations.
 - 3. Verify cut and fill slopes as specified in the contract documents. Work shall be performed by a Qualified Inspector.

END OF SECTION 312000

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SECTION 312100 - ROCK EXCAVATION (CLASS "B" EXCAVATION)

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Removal including, drilling, blasting, and protection of rock excavation.

1.2 DEFINITIONS

- A. Rock Excavation: Removal of igneous, metamorphic, or sedimentary rock or stone, boulders over two cubic yards in volume in open areas and one cubic yard in volume in trenches; and masonry, concrete, or solid frozen soil that cannot be removed by an excavator with an operating weight of at least 52,600 pounds and flywheel horse power of at least 153 HP, by rippers or other mechanical methods and, therefore, requires drilling and blasting.
 - 1. Mass Rock Excavation associated with general grading and earthwork. Solid Rock Excavation re- quired for utility trenching will be paid on a unit basis per the contract documents.
 - 2. Solid Trench Rock Excavation: Excavations having vertical sides whose depths exceed its width, made for storm sewer, sanitary sewer, water, gas pipes, electric, communications, light pole bases and building foundations, and related uses.

1.3 SUBMITTALS – NOT USED

1.4 REGULATORY REQUIREMENTS – NOT USED

1.5 SITE CONDITIONS

- A. Environmental Requirements: Determine environmental effects associated with proposed work and safeguard those concerns as regulated by law and local governing agencies by reasonable and practical methods.
- B. Existing Conditions: The Contractor shall be responsible for any and all damage and/or injury from the use of explosives. The Contractor shall save and hold harmless the Owner and Engineer from any and all claims from the use of explosives. Removal of materials of any nature by blasting shall be done in such a manner and at such times as to avoid damage affecting integrity of existing construction and damage to new or existing dwellings, structures and water wells in or adjacent to the area of the work. It shall be the Contractor's responsibility to determine the method of operation to ensure desired results and integrity of completed work. All damage caused by the Contractor's blasting operations shall be re- paired to the full satisfaction of the Owner at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS – NOT USED

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify site conditions and note subsurface conditions affecting work of this section.
- B. Identify required lines, levels, and elevations that will determine extent of proposed removals.

3.2 ROCK EXCAVATION

- A. Cut rock to form level bearing at bottom of roadway section and trench excavations. Remove shaled layers to provide sound and unshattered base for roadway. Contractor shall consider reuse of excavated materials on site in accordance with Earthwork Section. If material cannot be utilized on site, dis- pose of material offsite.
- B. If placed in embankments, perform rock excavation in manner that will produce material of such size as in accordance with Earthwork Section. Remove rock to allow for construction and/or installation of the site and building improvements as indicated on Construction Drawings. Remove loose or shattered rock, overhanging ledges and boulders which might dislodge.
- C. Use lean concrete or suitable materials as directed by registered geotechnical engineer to replace rock overblast or over excavation in building and expansion area to facilitate placement of utilities and foundations systems.

3.3 ROCK BLASTING – NOT USED

3.4 ROCK CUT FACE EXCAVATION

- A. The slope of the soil above the top of any permanently exposed rock cut face shall be no steeper than 3(H):1(V) unless otherwise noted on the Construction Drawings. Slope of the rock face shall meet the requirements below.

TYPE OF ROCK
Vertical)

SLOPE (Horizontal to

Solid limestone or sandstone
Interbedded limestone, sandstone or shale
Layered shale (no hard rock)

Vertical

- B. Benches of at least ten feet in width at a maximum of twenty feet in elevation intervals or as noted on the Construction Drawings. The benches shall serve to provide rock traps and divert water from the rock face.

3.5 ROCK TRAP

- A. Locate rock traps at the base of permanently exposed rock slopes and construct as indicated in the Construction Documents or Blasting Plan.

3.6 OVEREXCAVATION AND BACKFILL

- A. Over excavation which is required to remove unsuitable natural undisturbed bedrock weakened by weathering or other cause not inflicted by the Contractor shall be immediately reported to the Owner and performed as directed by the Owner, and the theoretical lines and grades will be adjusted accordingly. Material outside the excavation limits which are disturbed due to the fault or negligence of the Contractor or due to his failure to exercise sound construction practices, shall be either replaced by the Contractor with suitable materials (earth or concrete), or bolted, or both as directed, at no cost to the Owner.

END OF SECTION 312100

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SECTION 321200 – AGGREGATE BASE COURSE

1. AGGREGATE BASE COURSE

- A. This work shall consist of furnishing and placing compacted aggregate base course on a prepared subgrade in accordance with Earthwork section that extends a minimum of 1 foot beyond the edge of the proposed back of curb of the newly constructed pavement and at a grade and elevation necessary to achieve the elevations shown on the plan in accordance with Asphalt Pavement section.

2. MATERIALS

- A. The aggregate base course shall consist of Type 5 aggregate or similar crushed stone which meets the requirements conforming to specifications stated in the 2016 edition of the “Missouri Standard Specifications For Highway Construction” manual.

3. CONSTRUCTION REQUIREMENTS

- A. All work to be completed on that portion of subgrade on which the aggregate base course is to be constructed shall be completed in accordance with Earthwork section of these specifications.

4. PLACEMENT

- A. The Contractor shall on the prepared subgrade place loose lifts that are not to exceed 8 inches in thickness and shall be within 3 percent (3%) +/- of optimal moisture content.
- B. Each layer shall be compacted to a minimum of 95 percent of the standard maximum density as determined by the Standard Compaction Test in accordance with AASHTO T 99, Method C.
- C. If at any time the compacted aggregate base course becomes unstable, the Contractor, at the Contractor’s expense, shall restore the earth subgrade and the aggregate base course to the required widths, elevations, and density.
- D. The aggregate base course shall extend a minimum of 1 foot outside the proposed back of curb location.
- E. Compaction equipment shall be of suitable type and adequate to obtain the densities specified.
- F. Compaction equipment shall be operated in strict accordance with the manufacturer's instructions and recommendations. Equipment shall be maintained in such condition that it will deliver the manufacturer's rated compactive effort. If inadequate densities are obtained, larger and/or different types of additional equipment shall be provided by the

Contractor. Hand-operated equipment shall be capable of achieving the specified densities.

- G. Equipment for applying water shall be of a type and quality adequate for the work, shall not leak, and shall be equipped with a distributor bar or other approved device to assure uniform application. Equipment for mixing and drying out material shall consist of blades, discs, or other approved equipment.
- H. The Contractor shall maintain, at the Contractor's expense, the required density and surface condition of any portion of the completed aggregate base until the concrete pavement is placed.

5. QUALITY CONTROL/QUALITY ASSURANCE (QC/QA)

- A. The Contractor shall control operations to ensure the aggregate base course, in place, meets the specified requirements for density, thickness and width.
- B. The Owner at its discretion may choose to perform additional testing and inspection to verify that work is placed in accordance with these specifications.

END SECTION 321200

SECTION 321216 – ASPHALT PAVEMENT

1. GENERAL

- A. This Section includes: Installation of asphaltic concrete pavement. The surface course shall be asphaltic concrete as specified in the 2016 version of the “Missouri Standard Specifications for Highway Construction.”

2. DESCRIPTION OF WORK

- A. Construction of asphaltic pavement as depicted on the approved plans.

3. SUBMITTALS

- A. Material Certificates: Provide copies of materials certificates signed by material producer and Contractor certifying that each material item complies with, or exceed, specified requirements.

4. SITE CONDITIONS

- A. Weather Limitations: Apply tack coat when pavement and ambient temperature is above 45°F (7°C), and when temperature has not been below 35°F (1 C) for 12 hours immediately prior to application. Do not apply when pavement surface is wet or contains an excess of moisture.
- B. Construct asphalt pavement when atmospheric temperature is above 45°F (7°C), and when base is dry.
- C. Grade Control: Establish and maintain required lines and elevations.

5. MATERIALS

- A. General: Use materials as specified in the Plans.
- B. Coarse Aggregate: Sound, durable rock meeting the requirements of the Missouri Standard Specifications for Highway Construction.
- C. Fine Aggregate: Fine, granular material meeting the requirements of the Missouri Standard Specifications for Highway Construction.
- D. Mineral Filler: Rock or slag dust, hydraulic cement, or other inert material complying with the requirements of the Missouri Standard Specifications for Highway Construction.
- E. Asphalt Binder shall be homogenous and free from water, and shall not, on heating, foam below the specified minimum flash point. It shall be prepared by refining crude petroleum by suitable methods. It shall conform to the requirements of the Missouri Standard Specifications for Highway Construction.

F. Prime Coat: Cutback asphalt type, AASHTO M-82 (ASTM D2027) MC-30, MC-70 or MC-250.

G. Blotter Aggregate: Washed concrete sand.

6. ASPHALT AGGREGATE MIXTURE

A. Surface Course: Surface Course shall be composed of a design mix of BP-2 and shall comply with Missouri Standard Specifications for Highway Construction, Section 401.

B. Base Course: Base Course shall be composed of a design mix of Plant Mix Base Course and shall comply with Missouri Standard Specification for Highway Construction, Section 1.

7. SURFACE PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing asphalt.

B. Proof-roll prepared subbase surface to check for unstable areas and need for additional compaction. In areas too small or confined to proof-roll, method shall be approved by the Engineer. Do not begin paving work until such conditions have been corrected and are ready to receive paving.

C. Tack Coat: Apply to contact surfaces of previously constructed or prepared asphalt surfaces abutting or projecting into asphalt pavement. Distribute at rate of 0.05 to 0.15 gal. per sq. yd. of surface.

1. Allow to dry until at proper condition to receive asphalt pavement.

2. Exercise care in applying asphalt materials to avoid smearing of adjoining concrete surfaces. Remove and clean damaged surfaces.

8. PLACING MIX

A. General: Place asphalt pavement mixture on dry, prepared surface, spread and strike-off. Spread mixture at minimum temperature of 225°F (107°C). Place only when both air temperature and surface temperature are above 45°F. Place inaccessible and small areas by hand. Place each course to required grade, cross-section, and compacted thickness.

B. The mixture shall be spread only upon a clean and dry surface, and only when weather conditions are suitable.

C. Hot Joints: prior to the first pavement strip's temperature dropping below 200 degrees Fahrenheit, the second strip will be required to be laid alongside the first pavement strip. This will create a hot joint, the density on both sides of the joint will be compacted together to form a solid bond. The intent is to avoid cold longitudinal joints; this includes longitudinal and transverse butt joints.

- D. Butt Joints: Saw cutting cold transverse butt joints will be required. All saw cuts will be incidental to the contract.

9. **ROLLING**

- A. General: Begin rolling when mixture will bear roller weight without excessive displacement.
- B. Compact mixture with hot hand tampers or vibrating plate compactors approved by the Engineer in areas inaccessible to rollers.
- C. Breakdown Rolling: Accomplish breakdown or initial rolling using an eight ton to twelve-ton three-wheel roller or two-wheel tandem roller or self-propelled pneumatic roller immediately following rolling of joints and outside edge. Check surface after breakdown rolling, and repair displaced areas by loosening and filling, if required, with hot material.
- D. Second Rolling: Follow breakdown rolling as soon as possible, while mixture is hot with a pneumatic tire oscillating-type roller developing at least 80 pounds per square inch contact pressure for all wheels. Continue second rolling until mixture has been thoroughly compacted.
- E. Finish Rolling: Perform finish rolling while mixture is still warm enough for removal of roller marks with not less than a ten ton, two- or three-wheel tandem-type roller. Continue rolling until roller marks are eliminated and pavement has attained maximum density.
- F. The Contractor shall complete all Rolling activities prior to the asphalt mixture cooling below 185 degrees Fahrenheit.
- G. Patching: Remove and replace pavement areas mixed with foreign materials and defective areas. Cut-out such areas and fill with fresh, hot asphalt pavement mixture. Compact by rolling to maximum surface density and smoothness.
- H. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- I. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

10. **FIELD QUALITY CONTROL**

- A. General: Test in-place asphalt pavement courses for compliance with requirements for compaction, thickness and surface smoothness. Repair or remove and replace unacceptable pavement as directed by Engineer.

11. THICKNESS

- A. In-place compacted thickness will not be acceptable if exceeding the following allowable variation from required thickness:
 - 1. Surface Course: 2" nominal thickness, or as otherwise indicated on the plans, with a variance of no more than 1/4", plus or minus.
 - 2. Base Course: 2" nominal thickness, or as otherwise indicated on the plans, with a variance of no more than 1/4", plus or minus.

12. SURFACE SMOOTHNESS

- A. The surface of each layer shall be substantially free from waves or irregularities. The final surface shall not vary from a 10-foot straightedge, applied parallel to the centerline, by more than 1/8 inch. At transverse construction joints, the surface shall not vary from the 10-foot straightedge by more than 1/8 inch. The Profile Index (PRI) shall be no greater than 25 inches per mile, in accordance with the Missouri Standard Specifications for Highway Construction.
- B. Check surface areas at intervals as directed by Engineer.

13. CONCRETE CURB & GUTTER

- A. Refer to Curbs and Sidewalks section of this document for specifications for concrete curb & gutter.

END SECTION 321216

SECTION 321313 – PORTLAND CEMENT CONCRETE PAVEMENT

1. GENERAL

- A. This Section includes the installation of concrete pavement. Concrete pavement shall be as specified in the 2016 version of the “Missouri Standard Specifications For Highway Construction”.

2. SUMMARY

- A. The extent of Portland Cement Concrete paving is shown on drawings.
- B. Concrete and related materials are specified herein.

3. SUBMITTALS

- A. Provide samples, manufacturer's product data, test reports, and materials' certifications as required in referenced sections for concrete and joint fillers and sealers.

4. FORMS

- A. Forms. Steel, 2-inch dimensional wood or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects.
 - 1. Use flexible spring steel forms or laminated boards to form radius bends as required.
 - 2. Form material for the face of the curb shall not have any horizontal joints closer than 7 inches from the top of the curb.
 - 3. Provide stakes and bracing materials as required to hold forms securely in place.
 - 4. Tops of forms shall not depart from grade line more than 1/8 inch when checked with a 10-foot straightedge. Alignment of straight sections shall not vary more than 1/8 inch in 10 feet.
- B. Coat forms with a nonstaining form release agent that will not discolor or deface surface of concrete.

5. CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I.

- 1. Use one brand of cement throughout project, unless otherwise acceptable to Engineer.

- 2. Normal Weight Aggregates: ASTM C 33, and as herein specified. Provide aggregates

from a single source. Do not use fine or coarse aggregates containing spall-causing or other deleterious substances. Aggregates shall be "Meramec Sand and Gravel."

3. Lightweight Aggregates: ASTM C 330.

B. Water: Potable.

C. Air-Entraining Admixtures: Air-entraining admixtures shall meet the requirements of ASTM C 260 and shall be added to the mixer in the amount necessary to produce the specified air content. The air-entrainment agent and the water reducer admixture shall be compatible.

D. Water-Reducing Admixtures: Only if approved by the Engineer; water-reducing, set-controlling admixtures shall meet the requirements of ASTM C 494, Type A, water-reducing or Type D, water-reducing and retarding admixtures, and shall be added at the mixer separately from air-entraining admixtures in accordance with the manufacturer's printed instructions.

E. Grout: The grout mixture can be any commercially made product for highway patching made of an epoxy base. The grout shall be compatible with concrete and steel and capable of binding the dowel with the concrete. The matrix may be extended with hard durable aggregate following the manufacturer's recommendations. The grout shall be discarded after 45 minutes and shall not be retempered. The minimum strength shall be equal to the strength of the concrete pavement. Samples of the grout shall be submitted to the Engineer before grouting begins. Grout shall have a minimum strength of 4,000 psi in 28 days.

F. Liquid-Membrane Forming and Sealing Curing Compound: Comply with ASTM C 309, Type I, Class A unless otherwise specified by the Engineer. Moisture loss no more than 0.055 gr./sq. cm. when applied at 150 sq. ft./gal. Only white-pigmented compound may be used.

G. Joint Fillers: All expansion joints shall be "non-gassing."

1. Exposed curb and gutter joints shall be sealed with Crafcro "Asphalt Rubber Plus" or approved equal. Comply with ASTM 1190.

2. Expansion joint filler shall be 1/2-inch thick, preformed and nongassing. It shall be Homex Plus expansion joint material or approved equal.

6. CONCRETE PAVEMENT

A. CONCRETE MIX, DESIGN, AND TESTING

1. Design mix to produce normal-weight concrete consisting of Portland cement, aggregate, water-reducing or set retarding admixture, air-entraining admixture, and water to produce the following properties:

- a) Compressive Strength: 4,000 psi, minimum at 28 days, unless otherwise indicated.
- b) Air Content: 6 percent \pm 1-1/2 percent.

B. SURFACE PREPARATION

1. Remove loose material from compacted subbase surface immediately before placing concrete.
2. Proof-roll prepared subbase surface to check for unstable areas and need for additional compaction. In areas too small or confined to proof-roll, method shall be approved by the Engineer. Do not begin paving work until such conditions have been corrected and are ready to receive paving.
3. Aggregate Base
 - a) Top surface of the compacted aggregate base course shall be finished by blading or with automated equipment specially designed for the purpose and rolled with a steel-wheeled roller. Addition of thin layers of fine materials to the top of the base course to meet the grade will not be acceptable.
 - b) Surfaces of the completed aggregate base shall not deviate more than $\frac{1}{2}$ inch when tested with a 10-foot straightedge. The completed compacted thickness of any course shall be within plus $\frac{3}{4}$ inch and minus $\frac{1}{2}$ inch of indicated thickness, and the average thickness shall not be less than the design thickness indicated.

C. FORM CONSTRUCTION

1. Set forms to required grades and lines, braced and secured.
2. Clean forms after each use and coat with form release agent as required to ensure separation from concrete without damage.

D. CONCRETE PLACEMENT

1. Do not place concrete until subbase and forms have been checked for line and grade. Moisten subbase if required 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.
2. Place concrete by methods that prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with vibrator. Keep vibrator away from joint assemblies, or side forms. Consolidate with care to prevent dislocation of reinforcing, dowels, and joint devices. Use only square-faced shovels for hand spreading and consolidation.
3. Mixing and concreting operations shall be discontinued when a descending ambient temperature away from artificial heat reaches 40 degrees Fahrenheit and not resumed

until an ascending ambient temperature away from artificial heat reaches 35 degrees Fahrenheit. Concrete shall not be placed on subgrade with a temperature less than 35 degrees Fahrenheit. Concrete temperature shall not drop below 65 degrees Fahrenheit for a period of no less than 6 days after placement. Concrete exposed to melting snow during daytime and freezing during nighttime shall be protected from freezing until strength of at least 3500-psi has been attained.

4. If approval has been granted for the Contractor to place the concrete while the ambient temperature is at or lower than 40 degrees Fahrenheit, the Contractor shall take precautionary measures to prevent damage by freezing, such as heating mixing water, heating aggregates, or applying heat directly to the contents of the mixer. Aggregates shall not be heated higher than 150 degrees Fahrenheit, and the temperature of the aggregates and mixing water combined shall be not higher than 100 degrees Fahrenheit, when the cement is added. Unless otherwise authorized, the temperature of the mixed concrete when heating is employed shall not be less than 50 degrees Fahrenheit and not more than 80 degrees Fahrenheit at the time of placement. Cement or fine aggregate containing lumps or crusts of hardened material or frost shall not be used. Concrete shall not be placed upon a frozen subgrade.
5. Use bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
6. Deposit and spread concrete in a continuous operation between transverse joints as far as possible. If interrupted for more than ½ hour, place a construction joint.
7. When adjacent pavement lanes are placed in separate pours, do not operate equipment on concrete until pavement has attained sufficient strength to carry loads without injury.

E. JOINTS

1. All joints shall conform to these specifications and the drawings.
 - a) At locations where adjacent longitudinal concrete pavement is designated for replacement, a “Type G” longitudinal construction joint per MoDOT Standard Plans shall be installed. The dowel shall be centered exactly over the joint.
 - b) Transverse contraction joints in pavement shall conform to “TYPE G” transverse construction joints per MoDOT Standard Plans. The dowel shall be centered exactly over the joint.
 - c) All joints shall be placed at right angles to or radial to the centerline of the pavement unless directed otherwise.
2. Sawed Joints
 - a) Premolded strips shall not be used in place of saw cutting joints. All joints shall

be sawed according to the following:

- b) Transverse contraction joints in the pavement shall be sawed at fifteen-foot (15') intervals, or as directed by the Engineer, with the joint groove cut to the dimensions shown on the drawings. When the groove for poured type transverse joints is cut prior to removal of the forms, the groove shall be cut as close as is practical to the pavement edge; and the resulting crescent-shaped plug in the groove immediately adjacent to the form will be acceptable. Sawing of joints shall commence as soon as the concrete has hardened sufficiently to permit sawing without excessive raveling. All joints shall be sawed before shrinkage cracking takes place. In general, all joints shall be sawed in sequence.
3. Structures
- a) Manhole castings within pavement limits shall be boxed as directed by the Engineer in the field and surrounded by ½" white closed cell poly foam.
 - b) All catch basins shall be separated from the pavement by ¾ inch premolded expansion joint material extending completely through the curb and pavement slab. Catch basin sills shall be separated from the pavement by ¾ inch premolded expansion joint material extending completely through the pavement.
 - c) When a transverse joint falls within five feet of or contacts a drainage or utility structure, the joint shall be moved to either side to permit the joint to fall in the center of round structures or at the corner of rectangular structures and the joint spacing adjusted accordingly, or shall be placed as directed by the Engineer in the field.
 - d) Expansion Joints
 - e) Expansion joints shall be installed between the new pavement and any existing driveways.
 - f) Expansion joints shall be placed between any building or structure when new pavement is placed adjacent to that building or structure unless directed otherwise.
 - g) All expansion joint material shall be 8" tall and designed such that the top portion of the material can be removed after the concrete has set to leave a ½" channel that is ready to be sealed. It is the responsibility of the Contractor to remove and properly dispose of the excess material produced due to the formation of this ½" channel. The expansion joint material shall be approved by the Engineer prior to construction beginning.

F. CONCRETE FINISHING

1. After striking-off and consolidating concrete, smooth surface by screeding and floating. Use hand methods only where mechanical floating is not possible. Adjust floating to compact surface and produce uniform texture. See plans for description of

finished surfaces unless otherwise specified.

2. After floating, test surface for trueness with a 10-foot straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish.
3. Work gutters and back top edge of curb with an edging tool, and round to 1/2-inch radius, unless otherwise indicated. Eliminate tool marks on concrete surface.
4. After completion of floating and when excess moisture or surface sheen has disappeared, complete troweling and finish surface as follows:
 - a) Broom finish by drawing a fine-hair broom across concrete surface perpendicular to line of traffic. Repeat operation if required to provide a fine line texture acceptable to Engineer.
 - b) After form removal, clean ends of joints and point-up any minor honeycombed areas. Remove and replace areas or sections with major defects, as directed by Engineer.

G. CURING

1. Protect and cure finished concrete paving using white pigmented membrane-forming curing and sealing compound applied at a minimum of one gallon per 150 square feet or approved moist-curing methods. Apply per manufacturer's recommendations.
2. Protect pavement from rain by an approved means during the curing process.

H. REPAIRS AND PROTECTIONS

1. Repair or replace broken or defective concrete, as directed by the Engineer.
2. Drill test cores where directed by the Engineer when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland cement concrete bonded to pavement with epoxy adhesive.
3. Protect concrete from damage until acceptance of work.
4. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just before final inspection.

END OF SECTION 321313

SECTION 321350 – CURBS AND SIDEWALKS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Portland cement concrete curbs, gutters, and sidewalks.
- B. Related Requirements:
 - 1. Section 312000 - Earthwork: Preparation of subgrades.
 - 2. Section 321313 – Portland Cement Concrete.

1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. American Concrete Institute (ACI):
 - 1. ACI 305R - Hot Weather Concreting
 - 2. ACI 306R - Cold Weather Concreting
 - 3. ACI 306.1 - Cold Weather Concreting.
 - 4. ACI 308 - Curing Concrete
- C. ASTM International (ASTM):
 - 1. ASTM A185 - Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
 - 2. ASTM A615 - Deformed and Plain Billet-Steel for Concrete Reinforcement.
 - 3. ASTM C31 - Making and Curing Concrete Test Specimens in the Field.
 - 4. ASTM C39 - Comprehensive Strength of Cylindrical Concrete Specimens.
 - 5. ASTM C42 - Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
 - 6. ASTM C94 - Ready-Mixed Concrete.
 - 7. ASTM C138 - Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete.
 - 8. ASTM C143 - Slump of Hydraulic Cement Concrete.
 - 9. ASTM C231 - Air-Content of Freshly Mixed Concrete by the Pressure Method.
 - 10. ASTM C172 - Sampling Freshly Mixed Concrete.
 - 11. ASTM C173 - Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
 - 12. ASTM C260 - Air-Entraining Admixtures for Concrete.
 - 13. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.
 - 14. ASTM C618 - Fly Ash and Raw or Calcined Natural Pozzolan for use as a Mineral Admixture in Portland Cement Concrete.
 - 15. ASTM C989 - Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars.
 - 16. ASTM C1064 - Temperature of Freshly Mixed Portland Concrete Cement.
 - 17. ASTM C1218 - Water-Soluble Chloride in Mortar and Concrete.
 - 18. ASTM D98 - Calcium Chloride.
 - 19. ASTM D994 - Preformed Expansion Joint Filler for Concrete (Bituminous).
 - 20. ASTM D1190 - Concrete Joint Sealer, Hot Poured, Elastic Type.
 - 21. ASTM D1751 - Performed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 - 22. ASTM D2628 - Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements.
- D. Federal Specifications (FS):
 - 1. FS HH-F-341 - Fillers, Expansion Joint: Bituminous (Asphalt & Tar)

- E. State Highway Department Standard Specifications

1.3 SUBMITTALS

- A. Mix Design:
 - 1. Fill out and submit attached Concrete Mix Design Submittal Form.
 - 2. Submit three copies of each proposed mix.
 - 3. Submit separate mix design for concrete to be placed by pumping in addition to the mix design for concrete to be placed directly from the truck chute.
 - 4. Submit mix design to the Civil Engineering Consultant of Record, the Owner's Construction Testing Laboratory, and the Owner's Assigned Concrete Sub-Consultant.
 - 5. Include applicable information shown on the Mix Design Submittal Form and the following:
 - a. Proportions of cementitious materials, fine and coarse aggregate, and water.
 - b. Water-cementitious material ratio, 28-day compressive design strength, slump, and air content.
 - c. Type of cement, fly ash, slag and aggregate.
 - d. Aggregate gradation.
 - e. Type and dosage of admixtures.
 - f. Special requirements for pumping.
 - g. Range of ambient temperature and humidity for which design is valid.
 - h. Special characteristics of mix which require precautions in mixing, placing, or finishing techniques to achieve finished product specified.
 - i. Materials and methods for curing concrete.
- B. Submit certified laboratory test data or manufacturer's certificates and data for the items listed below certifying that materials are in conformance requirements specified herein. Submit to the Engineering Consultant of Record and the Construction Testing Laboratory for review and approval and within 7 calendar days after receipt of Notice-to-Proceed.
 - 1. Concrete mix design(s)
 - 2. Type and source of Portland cement, fly ash, and slag
 - 3. Aggregate gradations
 - 4. Preformed expansion joint filler
 - 5. Field molded/poured sealant
 - 6. Dowel bars
 - 7. Expansion sleeves
 - 8. Tie bars
 - 9. Reinforcing steel bars
 - 10. Welded wire fabric
 - 11. Air entraining admixtures
 - 12. Water-reducing, set-retarding and set-accelerating admixtures (if used)
- C. Test Reports: Submit field quality control test reports.

1.4 PROJECT CONDITIONS

- A. Maintain access for vehicular and pedestrian traffic as required for other construction activities. Utilize temporary striping, flagmen, barricades, warning signs, and warning lights as required.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Forms: Steel, wood, or other suitable material of size and strength to resist movement

during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. Forms shall be of depth equal to depth of curbing or sidewalk, and so designed as to permit secure fastening together at tops. Coat forms with nonstaining type of coating that will not discolor or deface surface of concrete.

- B. Welded Wire Mesh: Welded plain cold-drawn steel wire fabric, ASTM A185. Furnish in flat sheets.
- C. Reinforcing Steel: Deformed steel bars, ASTM A615, Grade 60.
- D. Portland Cement: Shall conform to ASTM C150, Type I.
- E. Fly Ash: ASTM C618, Class C or F. Use only one type and source throughout project.
- F. Slag: ASTM C989, Grade 100 or 120. Use only one type and source throughout project.
- G. Exterior Pavement Joint Materials
 - 1. Joint Back-up Material: Polyethylene foam, 100% closed cell.
 - 2. Sealant:
 - a. Dow 888, by Dow Corning.
 - b. 301 NS by Pecora.
 - c. Spectrum 800 or 900 by Tremco.
- H. Aggregate: ASTM C33.
- I. Water: Clean and potable
- J. Dowel Bars: ASTM A615, grade 60, and plain steel bars.
- K. Air Entrainment: ASTM C260. .
 - 1. Air-Mix or AEA-92, by Euclid Chemical Corp.
 - 2. MB-VR MB-AE 90, or Micro-Air, by BASF.
 - 3. Daravair or Darex Series, by W.R. Grace.
 - 4. Equivalent approved products.
- L. Liquid Membrane Curing and Sealing Compound: ASTM C1315, Type I, Class A or B, 25% minimum solids content, clear non-yellowing with no styrene-butadiene.
 - 1. Water Based, VOC less than 350 g/l:
 - a. Super Aqua Cure, by Euclid Chemical Corp.
 - b. Kure 1315 by BASF.
 - 2. Solvent Based
 - a. Super Rez-Seal, by Euclid Chemical Corp.
 - b. Kure-N-Seal 30 by BASF.

2.2 CONCRETE MIXING

- A. Mix concrete and deliver in accordance with ASTM C94. Design mix shall produce normal weight concrete consisting of Portland cement, supplementary cementitious materials, aggregates, admixtures and water to produce the following:
 - 1. Compressive Strength: 3,500 psi minimum at 28 days unless otherwise indicated on the Drawings.
 - 2. Slump Range: 2"-4" for hand placed concrete, 1-1/4" to 3" for machine placed (slipform) concrete.

3. Air Entrainment: 5 to 8 percent.
- B. Supplementary Cementitious Materials (SCM):
1. Concrete mix shall contain SCM at the amounts specified unless other amounts are approved by the Civil Engineer. Either fly ash or ground granulated blast furnace slag (GGBFS) may be used for the SCM but shall not be used together to form a ternary mix. Use of fly ash or GGBFS in the concrete mix is mandatory.
 2. Fly Ash: Substitute fly ash for Portland cement at 15% of the total cementitious content.
 - a. If used to mitigate potential aggregate reactivity, only Type F fly ash may be used and shall have the following maximum properties: 1.5% available alkali and 8.0% CaO. When a maximum of 25% replacement is used, up to 10.0% CaO is permitted.
 3. Ground Granulated Blast Furnace Slag (GGBFS): Substitute GGBFS for Portland cement at 20% of the total cementitious content.
 - a. If required to mitigate potential sulfate exposure or aggregate reactivity, up to 50% substitution of Portland cement is allowed.
 4. Maintain air-entrainment at specified levels.
- C. Calcium chloride:
1. Calcium chloride (Type L) may be used in solution form as part of the mixing water to accelerate concrete setting and early-strength development.
 - a. Amount of calcium chloride added shall not be more than necessary to produce the desired results and shall not exceed 2% by weight of cement.
 - b. The dosage range for the calcium chloride for the entire project shall not vary by more than 1%. Range is defined as the difference between the maximum and minimum dosages of calcium chloride for the entire project.
 - c. Calcium chloride shall not be used in the following applications unless approved by the Civil Engineer:
 - 1) concrete containing embedded dissimilar metals or aluminum
 - 2) slabs supported on permanent galvanized steel forms
 - 3) concrete exposed to deicing chemicals
 - 4) prestressed or post-tension concrete
 - 5) concrete containing aggregates with potentially deleterious reactivity and concrete exposed to soil
 - 6) concrete exposed to soil or water containing sulfates.
 2. Use calcium chloride in accordance with manufacturer's recommendation.
 3. Chloride-ion Concentration:
 - a. Maximum water-soluble chloride-ion concentrations in hardened concrete at ages from 28 to 42 days contributed from the ingredients including water, aggregates, cementitious material, and admixtures shall not exceed the following limits unless approved by the Civil Engineer:

Type of Member	Maximum water-soluble chloride ion (Cl-) content in concrete (percent by weight of cement)
Prestressed concrete	0.06
Reinforced concrete exposed to chloride in service	0.15
Reinforced concrete that will be dry	

or protected from moisture in service	1.00
Other reinforced concrete construction	0.30

4. When using calcium chloride or other admixtures containing chlorides, measure water-soluble chloride-ion content (percent by weight of cementitious materials) per ASTM C1218. Sample shall be from concrete representing the submitted mix design and maximum chloride dosage anticipated for the project.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Begin paving work only after unsuitable areas have been corrected and are ready to receive paving.
- B. Remove loose material from compacted base material surface to produce firm, smooth surface immediately before placing concrete.

3.2 INSTALLATION

- A. Form Construction
 1. Set forms to required grades and lines, rigidly braced and secured.
 2. Install sufficient quantity of forms to allow continuance of work and so that forms remain in place minimum of 24 hours after concrete placement.
 3. Check completed formwork for grade and alignment to following tolerances:
 - a. Top of forms not more than 1/8-inch in 10'-0".
 - b. Vertical face on longitudinal axis, not more than 1/4-inch in 10'-0".
 4. Clean forms after each use and coat with form release agent as often as required to ensure separation from concrete without damage.
- B. Reinforcement: Fasten reinforcing bars or welded wire fabric (if required) accurately and securely in place with suitable supports and ties. Remove from reinforcement all dirt, oil, loose mill scale, rust, and other substances that will prevent proper bonding of the concrete to the reinforcement.
- C. Concrete Placement
 1. Concrete shall be mixed and placed when the air temperature in the shade and away from artificial heat is a minimum of 35 degrees F and rising. Hot and cold weather concreting shall be in accordance with ACI 305R (hot weather) and 306.1 and 306R (cold weather). Do not place concrete until base material and forms have been checked for line and grade. Moisten base material if required to provide uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until set at required finish elevation and alignment.
 2. Place concrete using methods that prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Consolidate with care to prevent dislocation of reinforcing, dowels, and joint devices.
 3. Deposit and spread concrete in continuous operation between transverse joints, as far as possible. If interrupted for more than 1/2-hour, place construction joint. Automatic machine may be used for curb and gutter placement. Machine

placement shall be at required cross section, line, grade, finish, and jointing as specified for formed concrete. If results are not acceptable, remove and replace with formed concrete as specified herein.

D. Joint Construction

1. Contraction Joints: Construct concrete curb or combination concrete curb and gutter, where specified on Construction Drawings, in uniform sections of length specified on Construction Drawings. Form joints between sections either by steel templates, 1/8-inch in thickness, of length equal to width of curb and gutter, and with depth which will penetrate at least 2-inches below surface of curb and gutter; or with 3/4-inch-thick performed expansion joint filler cut to exact cross section of curb and gutter; or by sawing to depth of at least 2-inches while concrete is between 4 and 24 hours old. If steel templates are used, they shall be left in place until concrete has set enough to hold its shape, but shall be removed while forms are still in place.
2. Longitudinal Construction Joints: Tie concrete curb or combination concrete curb and gutter, where specified on Construction Drawings, to concrete pavement with 1/2-inch round deformed reinforcement bars of length and spacing shown on Construction Drawings.
3. Transverse Expansion Joints: Concrete curb, combination concrete curb and gutter, or concrete sidewalk shall have filler cut to exact cross section of curb, gutter, or sidewalk. Joints shall be similar to type of expansion joint used in adjacent pavement.

E. Joint Fillers: Extend joint fillers full-width and depth of joint, and not less than 1/2-inch or more than 1-inch below finished surface where joint sealer is indicated. Furnish joint fillers in 1-piece lengths for full width being placed, wherever possible. Where more than 1 length is required, lace or clip joint filler sections together.

F. Joint Sealants: Install in accordance with manufacturer's recommendations.

3.3 CONCRETE FINISHING

- A. After striking off and consolidating concrete, smooth surface by screeding and floating. Adjust floating to compact surface and produce uniform texture. After floating, test surface for trueness with 10'-0" straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide continuous smooth finish.
- B. Work edges of sidewalks, gutters, back top edge of curb, and formed joints with edging tool, rounding edge to 1/2-inch radius. Eliminate tool marks on concrete surface. After completion of floating and trowelling, when excess moisture or surface sheen has disappeared, complete surface finishing, as follows:
 1. Curbs, gutters, and sidewalks: Broom finish by drawing fine-hair broom across surface perpendicular to flow of traffic. Repeat operation as necessary to produce fine line texture.
- C. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point up minor honeycombed areas. Remove and replace areas or sections with major defects as directed Owner.

- D. Check surface areas at intervals necessary to eliminate ponding areas. Remove and replace unacceptable work as directed by Owner.

3.4 CURING AND PROTECTION

- A. Protect and cure finished concrete paving using with curing compound or with acceptable moist-curing methods in accordance with "water-curing" section of ACI 308. Cure for a period not less than 7 days.
- B. Use solvent based curing compound when compound is applied below 40 F.

3.5 BACKFILL

- A. After concrete has set sufficiently, spaces on either side of concrete curb, combination concrete curb and gutter, or concrete sidewalk shall be refilled to required elevation with suitable material compacted in accordance with Earthwork Section.

3.6 CLEANING AND PROTECTION

- A. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just prior to final inspection.
- B. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials.

END OF SECTION 321350

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SECTION 321723 - PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Painting and marking of pavements, curbs, guard posts, and light pole bases.

1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. American Association of State Highway and Transportation (AASHTO):
 - 1. AASHTO M247 - Glass Beads Used in Traffic Paints
 - 2. AASHTO M248 - Ready-Mixed White and Yellow Traffic Paints
- C. ASTM International (ASTM):
 - 1. ASTM D4414 - Standard Practice for Measurement of Wet Film Thickness by Notched Gauges.
- D. Federal Specifications (FS):
 - 1. FS A-A-2886 - Paint, Traffic, Solvent Based (supersedes FS TT-P-85 and FS TT-P-115, Type I)
 - 2. FS TT-B-1325 - Beads (Glass Spheres) Retro-Reflective
 - 3. FS TT-P-1952 - Paint, Traffic And Airfield Marking, Waterborne

1.3 PROJECT CONDITIONS

- A. Maintain access for vehicular and pedestrian traffic as required for other construction activities. Utilize flagmen, barricades, warning signs, and warning lights as required.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Paint shall be waterborne or solvent borne, colors as shown or specified herein. Pavement marking paints shall comply with applicable state and local laws enacted to ensure compliance with Federal Clean Air Standards. Paint materials shall conform to the restrictions of the local Air Pollution Control District.
- B. Waterborne Paint: Paints shall conform to FS TT-P-1952.
- C. Solvent Borne Paint: Paint shall conform to FS A-A-2886 or AASHTO M248. Paint shall be non-bleeding, quick-drying, and alkyd petroleum base paint suitable for traffic-bearing surface and be mixed in accordance with manufacturer's instructions before application for colors White, Yellow, Blue, and Red.
- D. Glass Beads: AASHTO M 247, Type 1 or FS TT-B-1325, Type 1,

GRADATION A. PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine the work area and correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.2 PREPARATION

- A. Sweep and clean surface to eliminate loose material and dust.
- B. Where existing pavement markings are indicated on Construction Drawings to be removed or would interfere with adhesion of new paint, a motorized abrasive device shall be used to remove the markings. Equipment employed shall not damage existing paving or create surfaces hazardous to vehicle or pedestrian traffic. Within public rights- of-way, appropriate governing authority shall approve method of marking removal.
- C. New pavement surfaces shall be allowed to cure for not less than 30 days before application of marking materials.

3.3 APPLICATION

- A. Apply two coats of same color of paint as specified below, at manufacturer's recommended rate, without addition of thinner, with maximum of 100 square feet per gallon or as required to provide a minimum wet film thickness of 15 mils and dry film thickness of 7 ½ mils per coat. Paint shall be applied for a total dry film thickness of 15 mils. Apply with mechanical equipment to produce uniform straight edges. At sidewalk curbs and crosswalks, use straightedge to ensure uniform, clean, and straight stripe.
- B. Install pavement markings according to manufacturer's recommended procedures for the specified material.
- C. Following items shall be painted with colors as noted on the Construction Drawings.
- D. Apply glass beads at pedestrian crosswalk striping and at lane striping and arrows at driveways connecting to public streets. Broadcast glass beads uniformly into wet markings at a rate of 6 lb/gal.

3.4 CLEANING

- A. Waste materials shall be removed at the end of each workday. Upon completion of the work, all containers and debris shall be removed from the site. Paint spots upon adjacent surfaces shall be carefully removed by approved procedures that will not damage the surfaces and the entire job left clean and acceptable.

END OF SECTION 321723

SECTION 329200 – FINISH GRADING AND SEEDING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Seeding.

1.2 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of planting soil.
- B. Manufactured Soil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- C. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.
- D. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath planting soil.
- E. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Certification of grass seed.
 - 1. Certification of each seed mixture for turfgrass sod.
- C. Product certificates.
- D. Planting Schedule: Indicating anticipated planting dates for each type of planting.

1.4 QUALITY ASSURANCE

- A. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.
 - 1. Report suitability of topsoil for lawn growth. State-recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory topsoil.

1.5 MAINTENANCE SERVICE

- A. Initial Lawn Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:

1. Seeded Lawns: 60 days from date of Substantial Completion.
 - a. When initial maintenance period has not elapsed before end of planting season, or if lawn is not fully established, continue maintenance during next planting season.

PART 2 PRODUCTS

2.1 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with United States Department of Agriculture Rules and Regulations under the Federal Seed Act. for purity and germination tolerances.
- B. Seed Species: State-certified seed of grass species, as follows:
 1. Proportioned by weight as follows:
 - a. 20% Falcon Fescue
 - b. 20% Calahari Fescue
 - c. 20% Scorpion Fescue
 - d. 20% Ultimate Fescue
 - e. 20% Fine Lawn Elite Fescue

2.2 TOPSOIL

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 4 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.
- B. Topsoil Source: Reuse surface soil stockpiled on-site. Verify suitability of stockpiled surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
- C. Supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient.

2.3 INORGANIC SOIL AMENDMENTS

- A. Lime: ASTM C 602, agricultural limestone containing a minimum of 80 percent calcium carbonate equivalent and as follows:
 1. Class: T, with a minimum of 99 percent passing through No. 8 sieve and a minimum of 75 percent passing through No. 60 sieve.
- B. Perlite: Horticultural perlite, soil amendment grade.
- C. Agricultural Gypsum: Finely ground, containing a minimum of 90 percent calcium

sulfate.

D. Sand: Clean, washed, natural or manufactured, free of toxic materials.

2.4 COMPOST

- A. Compost: Blended and ground leaf, wood and other plant-based material, composted for a minimum of 9 months and at temperatures sufficient to break down all woody fibers, seeds and leaf structures, free of toxic material at levels that are harmful to plants or humans. Source material shall be yard waste trimmings blended with other plant or manure based material designed to produce Compost high in fungal material.
1. Compost shall be commercially prepared Compost and meet US Compost Council STA/TMECC criteria or as modified in this section for “Compost as a Landscape Backfill Mix Component.”
 2. Compost shall comply with the following parameters”
 - a. pH: 5.5 – 8.0
 - b. Soil Salt (electrical conductivity); Maximum 5 dS/m (mmhos/cm).
 - c. Moisture content %, wet weight basis: 30-60.
 - d. Particle size, dry weight basis: 98% pass through ¾ inch screen or smear.
 - e. Stability carbon dioxide evolution rate: mg CO₂ – C/g OM/ day < 2
 - f. Solvita maturity test: >6.
 - g. Physical contaminants (inerts), %, dry weight basis: <1%.
 - h. Chemical contaminants, mg/kg (ppm): meet or exceed US EPA Class A standard, 40CFR § 503.13, Tables 1 and 3 levels.
 - i. Biological contaminants select pathogens fecal coliform bacteria, or salmonella, meet or exceed US EPA Class A standard, 40 CFR § 503.32(a) level requirements.

2.5 FERTILIZER

- A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
- B. Composition: 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
- C. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
- D. Composition: 12 percent nitrogen, 12 percent phosphoric acid, and 10 percent potash, by weight.

2.6 MULCHES

- A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.

PART 3 - EXECUTION

3.1 LAWN PREPARATION

- A. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 4 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
- B. Thoroughly blend planting soil mix off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.
- C. Spread planting soil mix to a depth of 4 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
- D. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.
- E. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- F. Before planting, restore areas if eroded or otherwise disturbed after finish grading.

3.2 SEEDING

- A. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
- B. Sow seed at a total rate of 7 to 8 lb./1000 square feet or 350 lb./acre.
- C. Rake seed lightly into top 1/8 inch of soil, roll lightly, and water with fine spray.
- D. Protect seeded areas by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches in loose depth over seeded areas. Spread by hand, blower, or other suitable equipment.
- E. Anchor straw mulch by crimping into soil with suitable mechanical equipment.

3.3 LAWN MAINTENANCE

- A. Maintain and establish lawn by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn. Provide materials and installation the same as those used in the original installation.
- B. Mow lawn as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings.

3.4 SATISFACTORY LAWNS

- A. Satisfactory Seeded Lawn: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any and bare spots not exceeding 5 by 5 inches.
- B. Use specified materials to reestablish lawns that do not comply with requirements and continue maintenance until lawns are satisfactory.

END SECTION 329200

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SECTION 331000 – WATER UTILITIES

SECTION 1 – WATER DISTRIBUTION

ARTICLE 1 - GENERAL

1.1 SUMMARY

Materials for use at any location in the water distribution system (extensions or existing) shall meet the requirements as set forth in the following Articles under this Section.

1.2 SUBMITTALS

- A. Product Data: Provide data on pipe materials, pipe fittings, and accessories. Provide shop drawings for precast inlets and catch basins
- B. Manufacturer's Certificate: Certify that products meet or exceed specified local requirements.
- C. Project Record Documents:
 - 1. Accurately record actual locations of pipe runs, connections, catch basins, cleanouts, and invert elevations.
 - 2. Identify and describe unexpected variations to subsoil conditions and location of uncharted utilities.

ARTICLE 2 – PIPE, PIPE JOINTS AND FITTINGS

2.1 Ductile Iron Pipe, Joints & Fittings: Pipe for use under this heading shall consist of durable, solid, ductile iron materials with the matrix being predominately ferrite. This material shall meet the following minimum physical strength requirements of: 60,000 psi, tensile, 42,000 psi, yield, and ten (10) percent maximum elongation. Each piece of pipe shall have the: weight, thickness, class manufacturer's mark, the year of manufacture, and the letters DI or word "DUCTILE" clearly stamped on the pipe. The pipe materials and construction shall be in accordance with all the requirements of A.S.A. Standard A21.51 (A.W.W.A. C-151). Minimum thickness class shall be Class 52 (Class 53 for flanged pipe). The pipe may be furnished with mechanical, push on, or flange joint ends as required.

A. Mechanical Joint Pipe & Fittings: Pipe and fittings of this joint type shall be furnished complete with all glands, gaskets, tee head bolts, hex nuts, etc., all properly sized and manufactured for the required pipe and fitting sizes. All fittings and bends shall be constructed of ductile iron. Materials for this service shall consist of durable, solid, ductile iron meeting the minimum physical requirements of 18,000 psi. tensile strength of 40,000 psi. modulus of rupture. Fittings and bend items shall be designed and tested to permit a minimum working pressure of 250 psi. prior to being shipped from the factory. All mechanical joint fittings, bends, and joint accessory materials shall conform to A.S.A. Standard A21.10 and A21.11.

B. Slip Joint Pipe & Fittings: Slip joint pipe shall be made of ductile iron as previously

specified. The plain end of the pipe shall be tapered to permit easy assembly. The pipe joint gasket shall meet all applicable requirements of A.S.A. Standard A21.10 with joints in accordance with Section 11-2.3 of A.S.A. Standard A21.11. Fittings and bends for use with slip joint piping shall be mechanical joint as previously specified.

- C. Flanged Pipe & Fittings: Pipe for use with flanged ends shall be ductile iron as previously specified. Threads for the screwed-on flanges shall be designed in accordance with A.S.A. Standard B2.1 Flanges for use shall be faced and drilled in accordance with A.S.A. Standard B16.1, 125 lb. All joint and joint materials shall be designed and tested for a minimum working pressure of 250 psi. Flanged branch fittings and bends shall meet or exceed the pipe and joint materials requirements. The flange joint bolt circle and drilled holes shall match those of A.S.A. Standard B16.1, 125 lb. All pipe and fittings shall be furnished with the properly sized; bolts, nuts, and best quality, 1/8-inch thick rubber gaskets.

The pipe and fittings shall be cement-lined and seal-coated in conformance with A.S.A. Standard A21.4 (A.W.W.A. C-104).

2.2 RIGID PLASTIC PIPE, JOINTS & FITTINGS

- A. Pipe for use under this heading shall be approved and accepted by Underwriter' Laboratories, Inc.
- B. Class 200, standard dimension ratio (S.D.R.) 21, P.V.C.:
 - 1. Materials: Pipe for use under this heading shall be manufactured from clean, virgin, N.S.F. approved, Type 1, Grade 1, 1120 P.V.C. conforming to A.S.T.M. specification D2241. The pipe shall be pressure rated for a hydrostatic working pressure of 200 psi. at 73.4 degrees F. and shall meet all applicable requirements as set forth under Commercial Standard (CS) 256-63. The pipe shall also conform to the following tests conducted at 73.4 degrees F.
 - a. Hydrostatic Integrity: The pipe shall withstand without failure, a pressure of 420 psi. for at least 1,000 hours, in accordance with A.S.T.M. Specifications 1598-63T. The pipe shall withstand without failure, a pressure of 630 psi. applied in 60 to 90 seconds in accordance with Specifications 2599-62T.

I.D. Size	Minimum Wall Thickness	
	Barrel	Bell or Coupling
4 in.	.267 in.	.507
6	.383	.623
8	.503	.806
10	.617	.955
12	.733	1.108

Concentricity: The outer diameter of the pipe shall be concentric within .003 of an inch.

2. Slip Joint Pipe: All pipe shall be joined by means of a rubber ring slip joint. Cement weld or glued joints will not be permitted. The slip joint may be formed by either a bell joint or a double ring coupling. The bell joint where used, shall be an integral and homogenous part of the pipe formed by extrusion, with a ring groove for seating the rubber ring gasket. The rubber ring gasket shall be partially split or perforated to permit expansion and contraction with respective increased or decreased pressure in the main. The double ring coupling shall be extruded from pipe materials as previously specified. The coupling interior shall be machined for two square-bottom gaskets and a center tapered stop. The double ring coupling shall be used with plain end pipe on which all ends are tapered to permit pushing the pipe into the coupling. The rubber ring gasket to be used with this coupling shall have a squared seating edge for placement in the coupling grooves. The rubber ring gasket shall also be partially split or perforated to permit expansion and contraction with main pressure changes.
3. Markings: Pipe markings shall include the following, marked continuously down the length:
 - a. Manufacturer's name.
 - b. Nominal Size.
 - c. Class Pressure Rating
 - d. Dimension Ratio Number.
 - e. PVC 1120.
 - f. NSF Logo.
 - g. Identification Code.
4. Lubrication: Lubrication shall be water soluble, non-toxic, be non-objectionable in taste and odor imparted to the fluid, be non-supporting of bacteria growth and have no deteriorating effect on the PVC or rubber gaskets.
5. Pipe Fittings: Branch, bend, transition, or cap type fittings to be used with rigid plastic shall be flanged or mechanical joint cast or ductile iron as previously specified. The fitting item shall be furnished with and include all; bolts, glands, transition gasket, etc., as required to fully make up the fitting connection joints.

2.3 RESTRAINED JOINT PVC PIPE

- A. Restrained joint PVC pipe shall meet the performance requirements of ASTM D2241. The PVC compound shall meet cell classification 12454 per ASTM D1784. All joints shall meet the requirements of ASTM D3139. O-rings shall meet the requirements of ASTM F477 "Standard Specification for Elastomeric Seals (Gaskets) for Joining

Plastic Pipe.)

- B. Restrained joint PVC shall be installed using a “permanent” joint system. Joint system shall provide a noncorrosive restrained joint by using machined grooves on the pipe and in the coupling which, when aligned, allow a spline to be inserted locking the pipe and coupling together. Provide an o-ring in the coupling to create a hydraulic seal.

2.4 COPPER PIPE & FITTINGS

- A. Copper pipe for all underground use as service or main lines, shall be “Type K”. All copper pipe produced for this service shall be in accordance with A.W.W.A. Specifications 75-CR. Fittings for use with the copper pipe material shall be constructed of brass or bronze, of the joint type as required for the specific connections and are subject to district approval.

ARTICLE 3 – VALVES AND VALVE BOXES

3.1 GATE VALVES

- A. All gate valves shall be non-rising stem, ductile iron body and wedge, bronze trim and stem, resilient seat gate valves conforming to AWWA C515, unless otherwise indicated. The disc shall have a resilient rubber seat ring mounted securely with stainless steel screws. All internal parts shall be epoxy coated. The valve stem seal shall be double “O”-ring and shall contain an anti-friction washer. The valve shall be as supplied by Mueller, Clow, American or approved equal.
- B. Valve ends shall be compatible with the pipe in which they are installed. Tapping valves shall be flanged by mechanical joint and shall be compatible with the specified tapping sleeve.
- C. All valves shall open left (counterclockwise) and have an operating nut capable of being turned by a standard gate valve key for buried valves and a handwheel for exposed valves.
- D. Each buried valve located within a paved area shall have a cast-iron (bituminous coated) valve box. Valve box shall be Tyler Pipe 564-S or approved equal.
- E. Each buried valve, which is not located within pavement, shall have a valve box consisting of a length of six inch PVC pipe topped with a Clay and Bailey Model 2194 cast iron valve box cover with a carsonite glass fiber/resin reinforced composite utility stake with the words “Water Valve”. The utility stake shall be “white” in color with “blue” lettering.

ARTICLE 4 – CONCRETE FOR THRUST BLOCKING AND PIPE ENCASEMENT

Concrete to be used for thrust blocking with various bends, tees, valves, fire hydrants, etc. shall

consist of ingredients designed to produce a mixture having a 3,500 psi. compressive strength of 28 days curing item. The mix shall be a “dry” as possible using only sufficient water to permit mixing and placement. Excessive water will not be permitted. Cement for use shall be the “high early” type to provide initial set as soon as possible. Concrete may be placed and covered with earth fill to prevent freezing during periods of cold weather. However, frozen ingredients will not be permitted for use. All concrete used and placed for this purpose shall be given at least three (3) days curing time before being placed under stress. Installation shall be in strict accordance with the applicable Articles under the following Section of these specifications.

Concrete for pipe encasement shall be of similar mix and design. Placement of the concrete shall be performed in such a manner so as to insure provision of a bed or cradle under the entire pipe length.

Where joints are to be encased, the piping shall be tested prior to concrete placement to maintain a pressure 50 percent greater than normal working pressure for a period of 4 hours. The Contractor shall provide all necessary equipment for conducting the pressure test as directed by the owner. All necessary precautions shall be taken to prevent flotation of the piping during or following placement of the encasement materials.

ARTICLE 5 – PIPE BEDDING

Materials to be used for this purpose shall consist of fine, clean, durable particles of crushed stone. Crushed stone used for this purpose shall consist of materials passing a 1-inch sieve to dust.

ARTICLE 6 – WATER MAIN TRACER TAPE

Water main tracer tape shall be installed with all water main. The materials to be installed for this purpose shall consist of three (3) inch wide tape made of bonded layer plastic with a metallic foil core. Tape splices shall be knotted to prevent tensile pressure on the splice. The material to be used for this service shall be “Terra Tape D” as manufactured by the Griffolyn Company of Houston, Texas, or approved equal. The metallic tape shall be colored to contrast with the soil and shall bear an imprint identifying the line below, such as, “Caution, Water Main Buried Below”.

Installation of the tracer tape shall be in accordance with applicable Articles of these specifications.

ARTICLE 7 – WATER MAIN LOCATOR WIRE

Water main locator wire shall be installed with all water main, fittings, and valve installation. The material to be installed for this purpose shall consist of standard electric service wire, a single No. 12 U.L. approved copper wire of the solid type with insulation for 600 volts. Insulated wire for this service shall be provided in standard rolls of not less than five hundred (500) foot lengths.

7.1 SPLICES

- A. Splices shall only be allowed where accessible. Buried splices will not be allowed.

7.2 WIRE CONTACT

- A. In order to make use of the wire for water main location purposes, a splice point shall be placed adjacent to a valve box location. The wire shall be brought to the ground surface at these locations so a power source can be connected. The wire shall run outside up alongside the valve box, then through a hole into the valve box 6-inches below ground level. The splice connector shall be left exposed at the top of the valve box at the wire contact locations. Wire contact points shall be provided at no more than 500-foot intervals. Wire shall also be run to allow for the location of water services. Wire shall be installed with service line from main to meter.

Water main locator wire installation shall be in accordance with applicable Articles of these specifications.

Prior to final acceptance by Owner, Contractor shall demonstrate that the locator wire works to the satisfaction of the Owner and/or his representative.

ARTICLE 8 – CONNECTION TO PRESENT SYSTEM

Materials to be used for connections to the present water distribution system shall be in accordance with the preceding Articles as applicable, under this Section of these specifications. Installation, testing and sterilization of all items shall be in strict accordance with the following Section of these specifications. Under all circumstances, extreme care must be exercised when connecting to the present system. Foreign materials of whatever nature, must not be permitted to enter the system. All direct connection fittings and valves shall be thoroughly rinsed or washed with a chlorine solution just prior to installation and connection. The chlorine solution to be used shall be mixed as stated in the following Section of the specifications.

If at all possible hot taps should be used to prevent system shut down.

Tapping sleeves for water lines shall be Smith-Blair Model 665, with stainless steel full circumference band and stainless steel flanged outlet as manufactured by the Smith-Blair Company or approved equal.

Tapping valves for water lines shall be Mueller flanged to mechanical joint Model T-2360-16, non-rising stem, resilient wedge seat, tapping valves or approved equal. Each valve shall include the required Mueller transition glands (A- 3999). Said valves shall be of the size required in the approved plans. All valves shall be manufactured in accordance with AWWA Standards C-515.

The Contractor shall notify the owner when system shutdown is required so that proper notification to those affected by the shutdown can be provided. Where system segment shutdown is required, the actual shutdown is not to be done until all connection materials, equipment, and personnel are at the site, and the existing system point of connection has been exposed, thoroughly cleaned, and prepared for immediate installation of the connection materials. All personnel shall be thoroughly

instructed as to the procedure to be followed and ready for work. All connections are then to be made in an efficient manner requiring the least amount of time and maximum amount of care.

ARTICLE 9 – ROAD CROSSING

MATERIALS NOT USED

ARTICLE 10 – FIRE HYDRANTS

Fire and flush hydrants permitted for use on all water system mains shall be the Mueller “Centurion”, Kennedy Model No. K81D, or approved equal unless otherwise specified on drawings. Each hydrant shall be of the traffic model type and manufactured to withstand a working pressure of 150 psi. in full compliance with the A.W.W.A. standard specifications C-502 of the latest revision. Three-way hydrants shall have two (2) hose nozzle connections and one (1) pumper nozzle. Three-way hydrants shall be the Mueller Model A-423 or approved equal. All hydrants shall have 5 ¼ -inch valve openings for mechanical joint connection to minimum six (6) inch water main unless otherwise noted. All hydrants shall be “red” in color.

10.1 AUXILIARY VALVES

- A. Fire hydrants are to be installed with auxiliary valves. Valves to be used for this purpose shall meet the requirements as stated in these specifications, and shall be sized as detailed on the approved plans. If the auxiliary valve is not directly connected to the main tee branch and hydrant, anchor couplings shall be used to secure the connection. Each valve shall be furnished with a valve box, lid and all joint accessories as required.

All fire hydrants and auxiliary valves shall be furnished and installed in accordance with the plan details, the detail notations, and applicable Articles of these specifications.

ARTICLE 11 – POLYETHYLENE ENCASEMENT FOR DUCTILE IRON PIPE

This Article covers materials for polyethylene encasement to be applied to underground installations of ductile iron pipe, fittings, valves, and other appurtenances.

Polyethylene film shall be manufactured of virgin polyethylene material conforming to the following requirements of A.S.T.M. Standard Specifications D-1248-78 for Polyethylene Plastics Molding and Extrusion Materials:

11.1 RAW MATERIAL USED TO MANUFACTURE POLYETHYLENE

FILM Type: 1

Class: A (natural) or B

(black) Grade: E-1

Flow rate: 0.4 maximum

Dielectric strength: Volume resistivity, minimum $\text{ohm-cm}^3=10^{15}$

11.2 POLYETHYLENE FILM

Tensile strength: 1200 psi (8.3 Mpa)

minimum Elongation: 300 percent

minimum
Dielectric strength: 800 V/mil. (31.5 um) thickness minimum

11.3 THICKNESS

Polyethylene film shall have a minimum thickness of 0.008-in. (8 mil. or 200 um). The minus tolerance on thickness shall not exceed 10 percent of the nominal thickness.

11.4 TUBE SIZE OR SHEET WIDTH

A. Tube size or sheet width for each pipe diameter shall be as listed below.

Nominal Pipe Diameter (in.)	Minimum Polyethylene Width	
	Flat Tube	in. (cm) Sheet
4	16 (41)	32 (82)
6	20 (51)	40 (102)
8	24 (61)	48 (122)
10	27 (69)	54 (137)
12	30 (76)	60 (152)
14	34 (86)	68 (172)
16	37 (94)	74 (188)
24	41 (104)	82 (208)

SECTION 2 – WATER DISTRIBUTION

SYSTEM INSTALLATION ARTICLE 1 -

GENERAL

The work covered by this Section of the specifications, shall consist of furnishing all previously specified materials with all necessary equipment, machinery, tools, and labor, and performing all work required to install and/or construct the water system extensions or changes with all connections and appurtenances as required; in accordance with all directives or modifications and these specifications, all to be complete, in place, accepted and ready for use.

ARTICLE 2 – SITE AND WORK PREPARATION

Prior to starting the various water main route installations, connections, and/or changes as required, the Contractor shall notify the Owner a minimum of forty-eight (48) hours prior to the start of construction. After so doing, the Contractor shall clear the route of all trees, shrubs, and other objects or materials, which may directly interfere with the construction. All other utility companies or organizations shall be notified for location of their respective facilities prior to starting any work. All trees, shrubs, bushes, etc., which will not interfere with the construction shall be protected from damage. Work preparations shall include having all necessary material items, equipment, and an adequate labor force at the site in working condition, and completely instructed and prepared to perform the work to completion as required.

ARTICLE 3 - DRAINAGE

The Contractor shall control the grading in the vicinity of the pipe trenches so that the surface of the ground will be properly sloped to prevent water from running into the excavated areas. Any water or other liquid wastes which accumulate in the excavated areas shall be promptly removed.

ARTICLE 4 – TRENCH EXCAVATION

4.1 GENERAL

- A. The Contractor shall perform all excavation necessary for or incidental to the proper installation and construction of the work shown and detailed on the drawings, or as described by the Owner. Excavation shall include the removal of trees, shrubs, paving, and undesirable materials. Excavation shall be done along the lines as indicated on the plans and shall be continuous without improper bends or kinks. Trenches shall be of sufficient width to provide a working space on each side of the materials being installed. During excavation, materials to be used for backfill shall be stock piled, in an orderly manner, a sufficient distance from the edge of the excavation to avoid overloading which might cause slides or cave-ins, and in such manner so as not to interfere with public travel whenever possible. The Contractor shall provide all barricades, lights, temporary crossing, warning signs, etc., that may be necessary to protect the public and the work from injury or damage.

4.2 DEPTH

- A. Trenches for water main and appurtenances shall be excavated to a sufficient depth to obtain a minimum of forty-two (42) inches of cover over the top of the pipe, except as otherwise required to make taps and connections to existing mains. All excavation shall be made so as to provide a continuous bearing for the barrel of the pipe. Holes of sufficient size shall be excavated to permit ample room for making joints. The bottom of trenches shall be free from rocks, clods, debris, and all other unsuitable materials, and shall consist of properly shaped earth, or tamped granular material as specified in the previous Section of these specifications. The Contractor shall take care not to excavate below grade except to remove undesirable material, or as directed by the Owner.

4.3 ROCK EXCAVATION

- A. Where rock is encountered in the trenching operation, the excavation shall be carried to a depth of four (4) inches below the pipe bottom depth assuming proper cover as specified under the preceding paragraph.

Excess materials resulting from the rock excavations shall be spread over or adjacent to the trench area where acceptable, or shall be picked up and removed from the site for disposal at a suitable location. It may also be necessary to place a thin layer of earth over the rock backfill areas. This may be hauled in from a stockpile location. This earth layer must be of sufficient depth to support the growth of vegetation. All loose rock and debris shall be thoroughly cleaned up and disposed of. The excavated areas shall be left in a neat, clean,

acceptable condition.

ARTICLE 5 – HANDLING OF MATERIALS

All pipe, fittings, valves, and other accessories, shall be unloaded, stored re-handled, and installed by methods in such a manner as to ensure their final location in a sound and undamaged condition, conforming in all respects to specified requirements. Under no circumstances shall pipe, fittings, valves, or other accessories, be dropped to the ground, or otherwise subjected to possible damage from impact or shock. Such materials shall be loaded by lifting with machine or hoist, or by skidding, Pipe handled on skidways shall not be skidded or rolled against other pipe.

Under all circumstances, all materials for use shall be handled in a workman-like manner, using the necessary manpower and equipment to perform the task in accordance with the manufacturer's recommendations.

5.1 PROTECTION OF MATERIALS, COATINGS, AND/OR LININGS

- A. All materials shall be handled in such manner that neither the coatings nor the linings are damaged. Hooks for insertion into the ends of the pipes, fittings, valves, and other accessories, shall have broad, well-padded contact surfaces, and shall be of such design and size that uniform support will be provided. Under most circumstances, damage to outside coatings are repairable, and the necessary repairs shall be properly made prior to installation. Damage to interior linings is not considered repairable, and therefore, the damaged items shall be replaced at the Contractor's expense.

5.2 HANDLING MATERIALS INTO TRENCH

- A. Proper equipment, tools, facilities, and methods satisfactory to the Owner, shall be provided and used by the Contractor for the safe handling, of all materials. Fittings, valves, and other accessories shall be carefully lowered into the trench or excavation, piece by piece to protect coatings and linings. Under no circumstances shall any materials be dropped or dumped into the trench.

ARTICLE 6 – PIPE LAYING

Laying of the pipe shall commence immediately after the excavation is started, and the Contractor shall use every possible means to keep the completed pipe installation closely behind the trenching. The Owner may stop the trenching if it appears that the trench is open too far in advance of the pipe laying operation. The Contractor may lay pipe in the best manner adapted to securing speed and good results.

6.1 PIPE JOINTS

- A. The Contractor shall have the necessary equipment and tools available for making

the joints for the specific materials being used. In accordance with applicable items under the previous Section of these specifications, acceptable joints for the various pipeline and fitting materials are listed as follows:

Cast or Ductile Iron Pipe: Ring or fluid-tite joint with mechanical joint for fittings, valves, and adapters.

P.V.C. Pipe: Ring-tite joint with necessary transition gaskets for connection to mechanical joint fittings, valves, and adapters.

1. Pipe Joint Adapters: The Contractor shall provide the necessary adapters for all connection changes from ring-tite, slip, or mechanical joint to flanged joint as and where required.

All pipe spigot ends shall be visibly marked to fully “make-up” the joint. With exception of field cut pipe, all “make-up” marks shall be placed on the pipe at the factory. Field cut pipe shall be marked for full joint depth prior to insertion.

6.2 PIPE CUTTING

- A. Cutting of pipe for closure pieces with installation of valves or fittings, or for any other reason, shall be done in a neat and workman-like manner without damage to the pipe or linings. The cutting operation shall leave a smooth cut end at right angles to the longitudinal axis of the pipe. The exterior surface of the cut end shall be beveled, and the interior surface shall be reamed or filed free of all rough edges and protrusions. All pipe cutting shall be done by saw or mechanical pipe cutters of an approved type. Upon completion of the cutting and trimming operation, the pipe end or ends shall be marked for “make-up” depth. Prior to insertion, the pipe shall be thoroughly cleaned of all foreign materials, including filing and cutting debris.

6.3 PIPE ALIGNMENT

- A. Pipelines intended to be straight shall be laid straight. Deflections from a straight line shall not exceed the manufacturer’s recommendations for joint deflections. Pipe shall be deflected at the joints only. Pipe barrel shall not be deflected. Should the planned or specified alignment require deflections in excess of the maximum recommended for the type of pipe being installed, when using a standard pipe length within the limits of available space, then either shorter pipe sections, or additional bends shall be installed. Under no circumstances shall PVC pipe be deflected except at the joint. PVC pipe shall not be placed under strain.

6.4 THRUST BLOCKING

- A. All mechanical or push-on (ring-tite) joint water main and connection installations, shall be thrust blocked for all bends of 22 ½ degree or more. All bends, tees, crosses, valves, tapping sleeve, and fire hydrant locations shall be thrust blocked in accordance

with district requirements. Bearing areas are determined on the basis of bearing against solid undisturbed earth. Concrete to be used for this purpose shall be designed for compressive strength as described in the previous Section of these specifications. All joint and fitting bolts shall remain accessible. Forming for thrust blocks to obtain the necessary bearing area shall be provided as required. All accessible form materials shall be removed from the trench prior to backfill.

6.5 EXISTING UTILITIES

- A. Existing utilities shall be protected during the construction period. Where necessary, the existing utility shall be removed or temporarily relocated, and replaced upon completion of that phase of the work creating this requirement. Under all circumstances, the utility involved and the parties being affected by the disrupted service shall be notified in advance of the proposed operation. All changes and work shall be subject to the approval and acceptance of the utility involved and the Owner.

6.6 QUALITY

- A. Damaged or unsound pipe, fittings, and accessories of whatever nature shall be rejected and removed from the work. All joints shall be made as previously specified. Each piece of pipe and all fittings, valves, etc., shall be checked and cleared of debris prior to being put in place. All gaskets shall be checked and cleaned of oil, grease, dirt, etc., before being inserted. All bolted joints shall be rechecked for operation and bolt tightness prior to installation. All open ends of pipe, fittings, etc., shall be carefully plugged or sealed at the end of each days work to prevent entrance of animals, water, and other foreign matter. All excavation shall be made to neat line and grade.

All personnel involved in any way with the work must be made aware of the fact that the work shall result in a first-class, professional job.

ARTICLE 7 – POLYETHYLENE ENCASEMENT INSTALLATION

The Contractor shall furnish all materials and install the polyethylene encasement as specified in the previous section of these specifications. The polyethylene encasement shall prevent contact between the pipe and the surrounding backfill and bedding material but is not intended to be a completely airtight and watertight enclosure. Overlaps shall be secured by the use of adhesive tape, plastic string, or any other material capable of holding the polyethylene encasement in place until backfilling operations are completed.

This Article includes three different methods of installation of polyethylene encasement on pipe. Methods A and B are for use with polyethylene tubes and method C is for use with polyethylene sheets.

7.1 METHOD A – ONE LENGTH OF POLYETHYLENE TUBE FOR EACH LENGTH OF PIPE

- A. The Contractor shall cut the polyethylene tube to a length of approximately two (2) foot longer than that of the pipe section. The tube shall then be placed around the pipe, centered to provide one (1) foot of overlap on each adjacent pipe section, and bunched accordion-fashion lengthwise until it clears the pipe ends.
- B. The pipe shall be lowered into the trench and the joint made up with the preceding section of pipe. A shallow bell hole shall be made at joints to facilitate installation of the polyethylene tube.
- C. After assembling the pipe joint, the bunched polyethylene shall be pulled from the preceding length of pipe, slipped over the end of the new length of pipe, and secured in place. The end of the polyethylene from the new pipe section shall be placed over the end of the first wrap until it overlaps the joint at the preceding length of pipe. The overlap shall next be secured in place by taking up slack width to make a snug, but not tight, fit along the barrel of the pipe and securing the fold at quarter points.
- D. All rips, punctures, or other damage to the polyethylene shall be repaired with adhesive tape or with a short length of polyethylene tube cut open, wrapped around the pipe, and secured in place. Proceed with installation of the next section of pipe in the same manner.

7.2 METHOD B – SEPARATE PIECES OF POLYETHYLENE TUBE FOR BARREL OF PIPE AND FOR JOINTS

- A. The Contractor shall cut the polyethylene tube to a length of approximately one (1) foot longer than that of the pipe, centered to provide six (6) inches of bare pipe at each end. Make polyethylene snug, but not tight; secure ends as described for Method A.
- B. Prior to making up a joint, a three (3) foot length of polyethylene tube shall be placed over the end of the preceding pipe section, bunched accordion-fashion lengthwise. After completion of the joint, the three (3) foot length of polyethylene shall be pulled over the joint, overlapping the polyethylene previously installed on each adjacent section of pipe by at least one (1) foot, made snug and secure at each end as described for Method A.
- C. All rips, punctures, or other damage to the polyethylene shall be repaired as described in Method A. Proceed with installation of the next section of pipe in the same manner.

7.3 METHOD C – FLAT POLYETHYLENE SHEET ENCASUREMENT

- A. Contractor shall cut polyethylene sheet to a length of approximately two (2) foot longer than that of the pipe section. The cut length shall be centered to provide a one (1) foot overlap on each adjacent pipe section, bunching it until it clears the pipe ends. The polyethylene shall be wrapped around the pipe so that it circumferentially overlaps the top quadrant of the pipe. The cut edge of the polyethylene shall be

secured at intervals of approximately three (3) foot.

- B. The wrapped pipe shall be placed into the trench and the pipe joint made up with the preceding section of pipe. A shallow bell hole shall be made at the joints to facilitate installation of the polyethylene. After completion of the joint, the overlap shall be described for Method A.
- C. All rips, punctures, or other damage to the polyethylene shall be repaired as described for Method A. Proceed with installation of the next section of pipe in the same manner.
- D. Bends, reducers, offsets, and other pipe-shaped appurtenances shall be covered with polyethylene in the same manner as the pipe. When valves, tees, crosses, and other odd-shaped pieces cannot be wrapped practically in a tube, they shall be wrapped with a flat sheet or split length of polyethylene tube by passing the sheet under the appurtenance and bring it up around the body. Seams shall be made by bringing the edges together, folding over twice, and taping down. Width and overlaps at joints shall be handled as described for Method A. Polyethylene shall be taped securely in place at valve stem and other penetrations, Where encountered, the Contractor shall provide openings for branches, service taps, blow-offs, air valves, and similar appurtenances by making an X-shaped cut in the polyethylene and temporarily folding back the film. After the appurtenance is installed, the slack shall be securely taped at the appurtenance and the cut repaired, as well as any other damaged areas in the polyethylene, with tape.
- E. Where polyethylene-wrapped pipe joins an adjacent pipe that is not wrapped, the Contractor shall extend the polyethylene wrap to cover the adjacent pipe for a distance of at least two (2) foot. The end shall be secured with circumferential turns of tape.
- F. The Contractor shall use the same backfill material as that specified for pipe without polyethylene wrapping, exercising care to prevent damage to the polyethylene wrapping when replacing backfill. Backfill material shall be free from cinders, refuse, boulders, rocks, stones, or other materials that could damage the polyethylene.

ARTICLE 8 – WATER MAIN TRACER TAPE INSTALLATION

The Contractor shall furnish all materials and install the water main tracer tape as specified in the previous Section of these specifications. The three (3) inch wide detectable tape shall be installed directly above the water main locations as the trench backfill progresses, to permit an earth cover of 12 to 18 inches over the tape. The tape material shall be installed in accordance with the manufacturer's recommendations. The tape is to be placed in a manner such that trench backfill settlement will not place an excessive tensile stress on the material.

ARTICLE 9 – WATER MAIN LOCATOR WIRE INSTALLATION

The Contractor shall furnish all materials and install the water main and service locator wire as

specified under the previous Section of these specifications. The No. 12 insulated wire shall be placed on top of the water main and secured with tap at 8 foot intervals. The wire shall be brought up along the outside of a valve box and brought through a hole drilled in the side of the box, 6-inches below finish grade. The wire shall be spliced at these locations using a standard plastic or rubberized wire connector. This will permit placing a power source on the wire for both directions in order to use same for locating the water main. Intermediate splices are not allowed. The wire shall be laid slack in the trench so same will not be subject tensile stress as the trench is being backfilled. A sufficient length of wire shall be coiled in meter pit to bring wire to grade.

Prior to final acceptance by Owner, Contractor shall demonstrate that the locator wire works to the satisfaction of the Owner and/or his representative.

ARTICLE 10 – VALVE INSTALLATION

Prior to installation, all valves shall be checked for bolt tightness and operation. All foreign matter, dirt, and debris, shall be removed from inside the valve body. The valve gate and guide shall be cleaned free of grease and dirt. After thoroughly cleaning and checking the valve for operation, the valve gate shall be closed, and the valve shall be installed in place. Following placement and connection to both sides of the valve, excavation for the valve bearing thrust block shall be made. The thrust block shall then be poured of concrete, in accordance with the previous Section of these specifications. The valve holding clamps, No. 4 reinforcing bars, shall then be placed over the valve with embedment in the concrete thrust block.

Following initial set of the concrete, the valve box as specified under the previous Section of these specifications shall be place over the valve body. The valve box shall be set plumb and earth shall be thoroughly tamped around the box to maintain the plumb position. The top of the valve box shall be adjusted for height to the level of the adjacent pavement if in a paved area, or shall be adjusted to stand four (4) inches above ground level, if located in an unpaved area. The lid or cover shall then be placed on the valve box. The valve box may require vertical adjustment from time to time as trench settling occurs. It is intended that upon final project completion, all valve boxes shall be left in a vertical plumb, usable position.

ARTICLE 11 – WORK ADJACENT TO-STATE OR COUNTY HIGHWAYS, OR

CROSSING GAS

MAINS NOT USED

ARTICLE 12 – TESTING WATER LINES

All newly laid water lines shall be tested prior to flushing and sterilization. Trenches may be backfilled as the pipe and accessories are installed, or where practicable and at the option of the Contractor. Trenches over the joint locations may be left open for visual inspection during tests. Prior to making tests, all air shall be expelled from the lines. If hydrants or blow-offs are not available, suitable taps shall be provided by the Contractor for this purpose at or near the end points of the installation.

12.1 HYDROSTATIC TESTS

- A. A two (2) hour test shall be made on each segment of the water lines between end points at a test pressure of at least 50% in excess of normal maximum operating pressure, not to exceed 200 psi. The test pressure shall be determined by the Owner and suitable gauges for checking same shall be supplied and connected by the Contractor. A gate valve or pressure relief valves shall be supplied and connected by the Contractor. A gate valve or pressure relief fitting shall be placed at each end of the segment being tested unless otherwise directed. Allowable pressure drop during the two (2) hour test shall be limited to 3% of the test pressure.

Any leaks evident at the surface shall be uncovered, repaired, and/or replaced. All leaking joints shall be tightened, or remade, or replaced, and re-tested. All pipe, fittings, valves, or other accessories found defective under this test shall be removed and replaced at the Contractors expense.

12.2 LEAKAGE TEST

- A. In the event that the pressure test indicates leakage, a leakage test shall be conducted as follows:

The Contractor shall furnish the gauge and measuring device for the leakage test, as well as the pump, pipe, connections and all other necessary apparatus, and shall furnish all necessary labor to conduct the test. The duration of each leakage test shall be one hour, and during the test, the piping shall be subjected to a hydrostatic pressure of 1.5 times the working pressure or rated pressure of the pipe, whichever of is greater. No pipe installation will be accepted until the leakage is less than ten (10) gallons per mile of pipe per inch diameter per 24 hours. Should any tests of pipe laid disclose leakage greater than that specified, the Contractor shall, at his own expense, locate and repair the defective joints until the leakage is within the specified allowance.

ARTICLE 13 – FLUSHING AND STERILIZING WATER LINES

After an acceptable hydrostatic test, the lines shall again be flushed. After flushing the lines, the pressure valves shall be closed, and enough water drained from segment to permit replacement of a chlorine solution. The chlorine solution shall consist of a powdered chlorine compound such as H.T.H. (calcium hypochlorite 65% available chlorine) thoroughly mixed with water. The chlorine solution shall be poured into the upstream test connection point. The amount of the chlorine compound to be used shall be determined by the Owner if the Contractor so desires. The chlorine solution shall yield 50 p.p.m. available chlorine. After pumping the required amount of solution into the water line segment with a positive displacement type pump, the connection shall be plugged, and the pressure valve opened. Water shall be flushed through the line until chlorine odor is detected at the opposite end of the installation. At this time, the pressure valve shall be closed and the segment shall be allowed to stand for a period of 24 hours. Following the 24-hour period, a chlorine residual level of a minimum of 10 p.p.m. must remain in the segment. If an acceptable

residual level is determined, the pressure valve shall again be opened and the segment flushed until all traces of chlorine over and above normal line levels have been eliminated. Should a leak occur during the sterilization procedure, it will be repaired and the sterilization and flushing will be repeated.

Upon successful completion of the testing and sterilization of each water main segment, and prior to placing same in service, the Contractor shall collect and submit two (2) separate standard bacteriological samples, taken a minimum of 24 hours apart, for analysis to a State of Missouri certified laboratory. Upon receipt of satisfactory test results, the water main segment may be placed in permanent service.

ARTICLE 14 – TRENCH BACKFILL

After placing the piping in the trench, the Contractor shall backfill under and around the pipe simultaneously filling and tamping on both sides with sufficient earth to firmly hold the pipe in position. Extreme care must be exercised with the backfill operations to ensure that no sizable stones or rocks come into contact with the pipe surfaces. After carefully placing and tamping the initial backfill in place to at least six (6) inches over the top of the pipe barrel, the remaining materials may be pushed into the trench. No boulders, broken pavement, or large pieces of blasted rock shall be used in the trench backfill. Any trench improperly bedded or backfilled shall be excavated, examined, and replaced at the Contractor's expense. All non-usable materials shall be picked up and removed from the site to an acceptable disposal location. Upon completion of the initial backfill, the backfill surface shall be either "jetted" with water or neatly mounded to allow for settlement. As the work progresses and settlement occurs, the trenching surface shall continue to be graded and shaped so as to secure a final condition where no further settlement shall occur.

In areas where pavement or permanent surfacing is removed and is to be replaced, the entire backfill shall be made using minus crushed stone in accordance with the previous Section of these specifications. Same shall be placed in six (6) inch layers and compacted to maximum density.

Initial clean-up, in accordance with this Section of these specifications shall occur as the trench backfill operation proceeds. Before final acceptance of the work is made, the Contractor shall travel the lines with the district, and any settlement or unsightly areas shall be repaired or corrected as directed. Upon acceptance, the Contractor shall proceed with the final clean-up, grading, and seeding operation, in accordance with this Section of these specifications.

ARTICLE 15 – FIRE HYDRANT AND AUXILIARY VALVE INSTALLATION

The fire hydrants, valves, and all connection items shall be furnished and installed by the Contractor. All materials used for this purpose shall be as specified under the previous Section of these specifications. The installation shall include all; excavation as required, installation of the water main tee fitting, auxiliary valve, connection pipe, hydrant, gravel fill, thrust or kick block, backfill, and surface replacement as required. The fire hydrants shall be installed to the proper "bury" depth, to stand in an exactly "plumb" position. Hydrant extension pieces may be used to adjust to proper grade as required. Clean gravel fill as specified and detailed, shall be placed to the proper depth and dimension to provide the necessary "weep" volume for water contained in the

hydrant thrust or kick block, to assure that cement paste does not plug or block the hydrant weep hole or the gravel fill under and around the weep hole.

The earth backfill shall be hand tamped around the hydrant base and barrel to assure the plumb position. The hydrants may be braced or wired in place until sufficient settlement has occurred to retain the plumb position. Upon completion, all bracing and debris shall be removed from the site. Each site shall then be thoroughly cleaned-up and restored equal to or better than its original condition. All installation sites shall be left in a neat, clean, acceptable condition.

ARTICLE 16 – SURFACE WATER CROSSINGS – NOT USED

ARTICLE 17 – SEPARATION OF WATER MAINS, SANITARY SEWERS AND COMBINED SEWERS

12.1 PARALLEL INSTALLATION (HORIZONTAL SEPARATION)

- A. Water mains shall be laid at least ten feet horizontally from any existing or proposed sewer. The distance shall be measured edge to edge. In cases where it is not practical to maintain a ten-foot separation, the department may allow deviation on a case-by-case basis, if supported by data from the design engineer. Such deviation may allow installation of the water main closer to a sewer, provided that the water main is laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer and in either case, at such an elevation that the bottom of the water main is at least 18 inches above the top of the sewer. In areas where the recommended separations cannot be obtained, either the waterline or the sewer line shall be constructed of mechanical joint pipe or cased in a continuous casing.

12.2 CROSSINGS (VERTICAL SEPARATION)

- A. Water mains crossing sewers shall be laid to provide a minimum vertical clear distance of 18 inches between the outside of the water main and the outside of the sewer. This shall be the case where the water main is either above or below the sewer. At crossings, the full length of water pipe shall be located so both joints will be as far from the sewer as possible but in no case less than ten (10) feet. Special structural support for the water and sewer pipes may be required. In areas where the recommended separations cannot be obtained either the waterline or the sewer line shall be constructed of mechanical joint pipe or cased in a continuous casing that extends no less than ten feet on both sides of the crossing.

12.3 FORCE MAINS

- A. There shall be at least a ten-foot horizontal separation between water mains and sanitary sewer force mains and they shall be in separate trenches. In areas where these separations cannot be obtained, either the waterline or the sewer line shall be cased in a continuous casing.

12.4 SEWER MANHOLES

- A. No waterline shall be located closer than ten feet to any part of a sanitary or combined sewer manhole.

12.5 DISPOSAL FACILITIES

- A. No waterline shall be located closer than 25 feet to any on-site wastewater disposal facility, agricultural waste disposal facility, or landfill.

ARTICLE 18 – INITIAL CLEAN UP, GRADING, AND REPLACEMENT

The Contractor shall provide the necessary labor and equipment to permit initial clean-up as the water main is being installed. Immediately following trench backfill, all areas disturbed by excavation shall be graded to conform to the adjacent ground levels. Earth shall be neatly mounded over the trench location. All debris, of whatever nature, due to the water main and service installation, shall be picked up and disposed of. All walks, driveways, roads, streets, etc., shall be replaced to original condition.

ARTICLE 19 – FINAL CLEAN-UP, FINISH GRADING, SEEDING AND STRAW

Following completion of the various routes and initial trench settlement, the Contractor shall go over the routes and clean-up all remaining debris. Following completion of the final clean-up, all areas in any way disturbed by the installation, shall be graded to conform to the adjacent ground areas. After final grading, the graded areas shall be sodded or seeded and covered with straw. In areas of rock excavation, it may be necessary to place a four-inch layer of earth over the exposed areas to form a seed bed for vegetation. The earth shall be applied as part of the final grading operation.

Upon completion of the final grading and seeding, the Contractor shall locate and paint the tops of all valve boxes the color “blue”, and other accessories having covers, so that they are plainly visible for use.

All service boxes for valves, future connection items, etc., be firmly in placed in a plumb position, ready and usable for the intended service. Following final completion of all items, the Contractor and Owner shall again go over the various routes to determine final acceptance.

END OF SECTION 331000

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SECTION 333000 - SANITARY SEWERAGE UTILITIES

PART 1 - GENERAL

1.1 SUMMARY

Materials for use at any location in the Sanitary Sewer system (extensions or existing) shall meet the requirements as set forth in the following Articles under this Section, or as noted and/or detailed on the project plans.

1.2 SUBMITTALS

- A. Product Data: Provide data on pipe materials, pipe fittings, and accessories. Provide shop drawings for precast inlets and catch basins
- B. Manufacturer's Certificate: Certify that products meet or exceed specified local requirements.
- C. Project Record Documents:
 - 1. Accurately record actual locations of pipe runs, connections, manholes, cleanouts, and invert elevations.
 - 2. Identify and describe unexpected variations to subsoil conditions and location of uncharted utilities.

PART 2 – PIPE, PIPE JOINTS AND FITTINGS

2.1 GRAVITY SEWER

- A. Rigid Plastic Pipe, Joints and Fittings: Pipe for use under this heading shall be of the bell and spigot type. All pipe and materials shall be made from P.V.C. components in accordance with A.S.T.M. specification D1784 for rigid polyvinyl chloride compounds. The pipe bell shall be an integral part of the pipe barrel. The spigot end of each pipe length shall be beveled to permit making up the joint. All pipe spigot ends shall be marked to show full make-up joint depth. All pipe shall meet or exceed the strength requirements when tested in accordance with A.S.T.M. specification D3034.
 - 1. Pipe Joint: All pipe shall be joined by means of a rubber ring slip joint. Cement weld or glued joints will not be permitted. The slip joint shall be formed by a bell joint. The bell joint where used, shall be an integral and homogenous part of the pipe formed by extrusion, with a ring groove for seating the rubber ring gasket. The rubber ring gasket shall be partially split or perforated to permit expansion and contraction with respective increased or decreased pressure in the main.
 - 2. Pipe Fittings: Lateral service line connected to the sewer main shall be made with wye type fittings inserted in the sewer main piping. Service laterals shall be installed as shown on the plans, or as directed. Each service lateral or we shall terminate with a rubber faced expander plug to fully seal the open pipe end until

same is required for service. Pipe fitting materials shall be the same as that specified for the piping materials. All fitting joints shall be sealed using rubber ring gaskets as previously specified.

All gravity sanitary sewer main and lateral service lines shall be SDR 21 PVC.

PART 3 - MANHOLES

3.1 MANHOLES

- A. Pre-Cast Manholes: Pre-cast manhole straight sections with eccentric top or cone sections may be used for manhole construction. Bottom sections, with properly located inlet and invert openings sized for sewer main as required, may be used. As will be noted from the plant profile segments, most manholes are designed for two tenths (0.2) foot of fall across the manhole. All manhole sections shall be fitted with, or provided with rubber coated manhole steps. Concrete for all pre-cast manhole sections shall be designed of ingredients that will produce a minimum 3,500 psi. compressive strength at 28 days. All sections shall be fully reinforced with welded wire fabric.
- B. Manhole Frames and Covers: Shall be of the type and duty as shown on the manhole plans. Iron castings shall conform to the latest revisions of ASTM and specification A-48, Class 20. All castings for use shall be true to pattern in form and dimensions, free from faults, sponginess, cracks, blowholes, and other defects. The bearing surfaces, between frames and covers, shall be machined, fitted together, and match marked, to prevent rocking.

PART 4 – PIPE BEDDING

- 4.1 Materials to be used for this purpose shall consist of fine, clean, durable particles of crushed stone. Crushed stone used for this purpose shall consist of materials passing a 1-inch sieve to dust or as noted on the construction drawings.

PART 5 – CONNECTION TO PRESENT SYSTEM

5.1 MATERIALS

- A. Materials to be used for connections to the present system shall be in accordance with the preceding Articles as applicable, under this Section of these specifications. Installation and testing of all items shall be in strict accordance with the following Section of these specifications. Under all circumstances, extreme care must be exercised when connecting to the present system. Foreign materials of whatever nature, must not be permitted to enter the system.
- B. The Contractor shall notify the Owner prior to connection so that proper notification to those affected may be provided. Where system segment shut-down is required, the

actual shut-down is not to be done until all connection materials, equipment, and personnel are at the site, and the existing system point of connection has been exposed, thoroughly cleaned, and prepared for immediate installation of the connection materials. All personnel shall be thoroughly instructed as to the procedure to be followed and ready for work. All connections are then to be made in an efficient manner requiring the least amount of time and maximum amount of care.

- C. Existing manholes shall be core bored or provided with a smooth cut for connection of new mains or services. The pipe to base connection shall be made using a rubber gasket around the pipe barrel with sufficient flap to act as a water stop when sealed in the socket or hole filler grout. An asphaltic-fibre cement shall be used over the joint connection around the full pipe diameter, after the filler grout has hardened. Concrete for additional support of the connecting sewer main, shall be placed under the piping adjacent to the manhole base.

PART 6 – CONCRETE FOR PIPE ENCASEMENT AND/OR SUPPORT

- 6.1 Concrete to be used for pipe encasement and support shall consist of ingredients designed to produce a mixture having a 3,500 psi., compressive strength at 28 days curing time. The mix shall be as “dry” as possible using only sufficient water to permit mixing and placement. Excessive water will not be permitted. Cement for use shall be the “high early” type to provide initial set as soon as possible. Concrete may be placed and covered with earth fill to prevent freezing during periods of cold weather. However, frozen ingredients will not be permitted for use. All concrete used and placed for this purpose shall be given at least three (3) days curing time before being placed under stress.

SANITARY SEWER COLLECTION SYSTEM INSTALLATION

PART 1 – GENERAL

- 1.1 Underground pipe construction shall be in accordance with the recommended practice as outlined by the pipe manufacturer.
- 1.2 All excavations shall be made to such depths and widths as will give ample room for building all structures, sewers, and appurtenances as detailed on the approved plans.
- 1.3 Clearing and grubbing the site of work, excavation of earth or other materials, sheeting and bracing, pumping and drainage, backfilling, rough grading, and cleaning up shall all be done as specified. In addition, all work maintaining or replacing existing fences, roadways, drives, lawns or structures disturbed by the work, safety precautions and other miscellaneous general work not specified under specific items is to be included in the work done under this section.

PART 2 - SITE AND WORK PREPARATION

- 2.1 Prior to starting the various installations, connections, and/or changes as required the

contractor shall notify the Owner a minimum of twenty-four (24) hours prior to the start of construction. After so doing, the Contractor shall clear the route of all trees, shrubs, and other objects or materials which may directly interfere with the construction. All other utility companies or organizations shall be notified for location of their respective facilities prior to starting any work. All trees, shrubs, bushes, etc., which will not interfere with the construction shall be protected from damage. Work preparations shall include having all necessary material items, equipment, and an adequate labor force at the site in working condition, and completely instructed and prepared to perform the work to completion as required.

PART 3 - DRAINAGE

- 3.1 The Contractor shall control the grading in the vicinity of the pipe trenches so that the surface of the ground will be properly sloped to prevent water from running into the excavated areas. Any water or other liquid wastes which accumulate in the excavated areas shall be promptly removed.

PART 4 - TRENCH EXCAVATION

- 4.1 Contractor shall perform all excavation necessary for or incidental to the proper installation and construction of the work shown and detailed on the drawings, or as directed by the Engineer. Excavation shall include the removal of trees, shrubs, paving, and undesirable materials. Excavation shall be done along the lines as staked, and indicated on the plans and shall be continuous without improper bends or kinks. Trenches shall be of sufficient width to provide a working space on each side of the materials being installed. During excavation, materials to be used for backfill shall be stock piled, in an orderly manner, a sufficient distance from the edge of the excavation to avoid overloading which might cause slides of cave-ins, and in such manner so as not to interfere with public travel whenever possible. The contractor shall provide all barricades, lights, temporary crossing, warning signs, etc., that may be necessary to protect the public and the work from injury or damage.
- 4.2 Trenches for sewer main and appurtenances shall be excavated to a sufficient depth to obtain a minimum of thirty-six (36) inches of cover over the top of the pipe, except as otherwise required to make taps and connections to existing mains. All excavation shall be made so as to provide a continuous bearing for the barrel of the pipe. Holes of sufficient size shall be excavated to permit ample room for making joints. The bottom of trenches shall be free from rocks, clods, debris, and all other unsuitable materials, and shall consist of properly shaped earth, or tamped granular material as specified in the previous Section of the specifications. The Contractor shall take care not to excavate below grade except to remove undesirable material, or as directed by the Engineer.
- 4.3 Where rock is encountered in the trenching operation, the excavation shall be carried to a depth of four (4) inches below the pipe bottom depth assuming proper cover as specified under the preceding paragraph.
- 4.4 Excess materials resulting from the rock excavations shall be spread over or adjacent to the

trench area where acceptable, or shall be picked up and removed from the site for disposal at a suitable location. It may also be necessary to place a thin layer of earth over the rock backfill areas. This may be hauled in from a stockpile location. This earth layer must be of sufficient depth to support the growth of vegetation. All loose rock and debris shall be thoroughly cleaned up and disposed of. The excavated areas shall be left in a neat, clean, acceptable condition.

PART 5 - HANDLING OF MATERIALS

- 5.1 All pipe, fittings, valves, manholes and other accessories, shall be unloaded, stored rehandled, and installed by methods and in such a manner as to ensure their final location in a sound and undamaged condition, conforming in all respects to specified requirements. Under no circumstances shall pipe, fittings, valves, manholes, or other accessories, be dropped to the ground, or otherwise subjected to possible damage from impact or shock. Such materials shall be loaded by lifting with machine or hoist, or by skidding. Pipe handled on skidways shall not be skidded or rolled against other pipe. When pipe line materials at the site of the work, each piece shall be unloaded opposite, or as close as possible to the point of installation in order to avoid unnecessary rehandling.
- 5.2 Under all circumstances, all materials for use shall be handled in a workman-like manner, using the necessary manpower and equipment to perform the task in accordance with the manufacturer's recommendations.
- A. Protection of Materials, Coatings, and/or Linings: All materials shall be handled in such manner that neither the coatings or the linings will be damaged. Hooks for insertion into the ends of the pipes, fittings, valves, manholes, and other accessories, shall have broad, well-padded contact surfaces, and shall be of such design and size that uniform support will be provided. Under most circumstances, damage to outside coatings are repairable, and the necessary repairs shall be properly made prior to installation. Damage to interior linings are not considered repairable, and therefore, the damaged item shall be replaced at the Contractor's expense.
- B. Handling Materials Into Trench: Proper equipment, tools, facilities, and methods satisfactory to the Engineer, shall be provided and used by the Contractor for the safe handling of all materials. Fittings, valves, and other accessories shall be carefully lowered into the trench or excavation, piece to piece to protect coatings and linings. Under no circumstances shall any materials be dropped or dumped into the trench.

PART 6 - PIPE LAYING AND TRENCH BACKFILL

6.1 GENERAL

- A. Installation shall start at the downstream end of the project and shall proceed upstream. All pipe spigot ends shall face downstream and bell ends shall face upstream. Laying of the pipe shall commence immediately after the excavation is started, and the

Contractor shall use every possible means to keep the completed pipe installation closely behind the trenching. The Engineer may stop the trenching when in his opinion, the trench is open too far in advance of the pipe laying operation. The Contractor may lay pipe in the best manner adapted to securing speed and good results.

6.2 PIPE JOINTS

A. The Contractor shall have the necessary equipment and tools available for making the joints for the specific materials being used. In accordance with applicable items under the previous Section of these specifications, acceptable joints for the various pipe line and fitting materials are listed as follows:

1. P.V.C. Pipe: Ring title joint with necessary transition gaskets for connection to mechanical joint fittings, valves, and adapters.
 - a. Pipe Joint Adapters: The Contractor shall provide the necessary adapters for all connection changes from ring-title, slip, or mechanical joint to flanged joint as and where required.

All pipe spigot ends shall be visibly marked to fully “make-up” the joint. With exception of field cut pipe, all “make-up” marks shall be placed on the pipe at the factory. Field cut pipe shall be marked for full joint depth prior to insertion.

6.3 PIPE CUTTING

A. Cutting of pipe for closure pieces with installation of valves or fittings, or for any other reason, shall be done in a neat and workman-like manner without damage to the pipe or linings. The cutting operation shall leave a smooth cut end at right angles to the longitudinal axis of the pipe. The exterior surface of the cut end shall be beveled, and the interior surface shall be reamed or filed free of all rough edges and protrusions. All pipe cutting shall be done by saw or mechanical pipe cutters of an approved type. Upon completion of the cutting and trimming operation, the pipe end or ends shall be marked for “make-up” depth. Prior to insertion, the pipe shall be thoroughly cleaned of all foreign materials, including filing and cutting debris.

6.4 PIPE ALIGNMENT

A. Pipe lines intended to be straight shall be laid straight. Deflections from a straight line shall not exceed the manufacturers recommendations for joint deflections. Should the planned or specified alignment require deflections in excess of the maximum recommended for the type of pipe being installed, when using a standard pipe length within the limits of available space, then either shorter pipe sections, or additional bends shall be installed.

6.5 EXISTING UTILITIES

- A. Existing utilities shall be protected during the construction period. Where necessary, the existing utility shall be removed or temporarily relocated, and replaced upon completion of that phase of the work creating this requirement. Under all circumstances, the utility involved and the parties being affected by the disrupted service shall be notified in advance of the proposed operation. All changes and work shall be subject to the approval and acceptance of the utility involved and the Engineer.

6.6 QUALITY

- A. Damaged or unsound pipe, fittings, and accessories of whatever nature shall be rejected and removed from the work. All joints shall be made as previously specified. Each piece of pipe and all fittings, valves, etc., shall be checked and cleared of debris prior to being put in place. All gaskets shall be rechecked for operation and bolt tightness prior to installation. All open ends of pipe, fittings, etc., shall be carefully plugged or sealed at the end of each day's work to prevent entrance of animals, water, and other foreign matter. All excavation shall be made to neat line and grade.

All personnel involved in any way with the work must be made aware of the fact that the work shall result in a first-class, professional job.

6.7 TRENCH BACKFILL

- A. After placing the piping in the trench, the Contractor shall backfill under and around the pipe simultaneously filling and tamping on both sides with sufficient earth to firmly hold the pipe in position. Extreme care must be exercised with the backfill operations to ensure that no sizable stones or rocks come into contact with the pipe surfaces. After carefully placing and tamping the initial backfill in place to at least six (6) inches over the top of the pipe barrel, the remaining materials may be pushed into the trench. No boulders, broken pavement, or large pieces of blasted rock shall be used in the trench backfill. Any trench improperly bedded or backfilled shall be excavated, examined, and replaced at the Contractor's expense. All non-usable materials shall be picked up and removed from the site to an acceptable disposal location. Upon completion of the initial backfill, the backfill surface shall be neatly mounded to allow for settlement. As the work progresses and settlement occurs, the trenching surface shall continue to be graded and shaped so as to secure a final condition where no further settlement shall occur.
- B. In areas where pavement or permanent surfacing is removed and is to be replaced, the entire backfill shall be made using fine crushed stone placed in six (6) inch layers and compacted to a maximum density.
- C. Initial clean-up, in accordance with Article 14 shall occur as the trench backfill operation proceeds. Before final acceptance of the work is made, the Contractor shall travel the lines with the Engineer, and any settlement or unsightly areas shall be repaired or corrected as directed. Upon acceptance, the Contractor shall proceed with the final clean-up, grading, and seeding operation, in accordance with Article 15 this

Section of the specifications.

PART 7 – SERVICE LINE WYE INSTALLATION

7.1 The Contractor shall furnish all materials and install service connection fittings and service lines as required.

- A. Sewer Main Service Line Connection Fittings: Fittings for service line connection to the sanitary sewer main shall be placed where indicated in the field by the Engineer. All service connection fittings shall be wye or double wye fittings in accordance with Article 2 of Section III of the specifications. All service connection fitting joints shall be watertight and of a quality equal to that of the sanitary main being used.
- B. Sewer Lateral Service Line: The Contractor shall furnish all materials and install sewer lateral service lines from connection to the sewer main wye fitting as shown on the plans.

All service lines and wye installed for future connections shall terminate with a rubber faced threaded compression type expanded plug. All service line and fittings shall be in accordance with Article 2 of Section III of the specifications.

PART 8 – MANHOLE INSTALLATION

8.1 BASE

A. Pre-cast manhole base sections shall be set on the prepared sub-grade in proper alignment for connection to the inlet and discharge connections. In the event fill under the base section is required to achieve the proper grade, it shall be made using a 1 inch minus crushed stone fill, fully compacted to sub-grade. Earth fill under pre-cast base sections will not be permitted.

- 1. Pipe Connections: Sewer main connections to the manhole base shall be made prior to placement of the manhole barrel sections. The pipe to base connection shall be made using a rubber gasket around the pipe barrel with sufficient flap to act as a water stop when sealed in the socket or hole filler grout. An asphaltic-fibre cement shall be used over the joint connection around the full pipe diameter, after the filler grout has hardened. Concrete for additional support of the connecting sewer main, shall be placed under the piping adjacent to the manhole base.

8.2 BARREL

A. The manhole barrel shall be set on the pre-cast base. The barrel shall be constructed of pre-cast sections as previously specified.

- 1. Pre-Cast Sections: The barrel to base joint shall be sealed using the rubber ring provided for this purpose when placing same over a pre-cast base section. The remaining seam shall be sealed using an asphaltic-fibre cement on the interior and exterior joint locations. All remaining barrel joints and top or cone to barrel

joint connection, shall be sealed using the rubber gasket and asphaltic-fibre cement application.

The entire exterior of the manhole shall be coated with asphaltic-fibre cement to achieve a water-tight seal.

An eccentric pre-cast top or cone section shall be placed over the manhole barrel sections. The top to barrel joint seal shall be made as previously specified for pre-cast section joints. All manhole steps shall be in alignment with the vertical wall of the manhole. The top of the cone section shall provide a 24-inch diameter circular opening.

8.3 MANHOLE COMPLETION

- A. Upon completion of the manhole barrel construction, all debris shall be removed from the excavated area and disposed of. Following clean up; the excavated area shall be backfilled with clean earth. Care must be exercised to maintain the manhole barrel joints in a scaled condition. The backfill may be carefully jetted with water to achieve initial settlement. Following initial settlement, the top of the manhole cover frame shall then be set in place using the frame lugs to center the frame over the opening. It is intended that the frame to top of cone seal shall be watertight. The manhole cover shall then be put in place. Following placement of the manhole frame and cover, the backfill operation shall proceed to the top of the manhole frame and cover.

All backfill operations shall be in accordance with the applicable Articles of the specifications. All manhole construction, frame and cover, etc., shall be in accordance with the plan details and notations.

PART 9 – TESTING OF GRAVITY SEWERS

The extent of testing shall be at the discretion of the owner and engineer.

9.1 GENERAL

After construction and backfilling are completed and before any services are connected the sewers, the completed lines shall be tested for leaks, and visually checked for straightness of line

and cracked pipe. If any deficiencies in line or grade are found which will be detrimental to the proper functioning of the sewer, the deficiencies shall be corrected. Any damaged or cracked pipe shall be excavated and re-laid in a manner satisfactory to the Owner. Any section of sewer, which is found to be leaking in excess of the allowable quantity, shall be repaired.

9.2 ACCEPTANCE TESTS

- A. Each reach of sewer shall meet the requirements of the following shall be repaired to the satisfaction of the Owner.

1. Upon completion of the sewers, acceptance tests will be conducted by the Contractor in the presence of the Engineer to determine the acceptability of the sewers. The testing schedule shall be submitted to the Engineer by the Contractor prior to testing. The Contractor shall furnish suitable test equipment, materials and manpower to conduct the test.
2. All completed pipe sewers shall be subject to an exfiltration test. The sewer pipe shall sustain a maximum limit of 100 gallons per inch of diameter per day per mile. The exfiltration test shall cover a period of at least four continuous and connective hours. For purposes of determining maximum allowable leakage, manholes shall be considered a section of 48-inch pipe.
3. No ground water in an amount greater than that allowed and specified herein for the exfiltration test shall be permitted.
4. Any completed pipe sewers not conforming to the tests herein specified or conforming to all requirements of the specifications, plans and profiles, or subject to any irregularity of construction shall be removed and replaced.
5. The Contractor shall cooperate fully with the Engineer for the inspection and testing of the completed work.
6. Stoppers and/or plugs for the various sizes of pipe shall be furnished by the Contractor for use in the tests and personnel shall be made available by the Contractor for aid in conducting the tests herein specified.
7. As an alternate to the exfiltration test, a low-pressure air test may be conducted after backfilling and before replacing pavement. The equipment shall be provided and tests shall be conducted by the Contractor in the presence of the Engineer.
8. The Contractor may desire to make an air test prior to backfill for his own purpose, but "Acceptance Test" shall be conducted after backfill.
9. All wyes, tees or ends of lateral or service stubs shall be suitably capped to withstand the internal pressure during testing. Such caps shall be easily removable for future connections or extensions.
10. After each manhole-to-manhole section of line has been backfilled and cleaned, the ends shall be plugged with pneumatic plugs. These plugs shall be designed such that they will hold against line test pressure without requiring blocking or bracing. All pneumatic plugs shall pass a qualifying test in the presence of the Engineer before actual line testing as follows: One length of pipe shall be laid on the ground and sealed at both ends with the pneumatic plugs being tested. Air shall be introduced into the pipe until the pipe pressure reaches 9 psi. The pneumatic plugs shall hold against this pressure without bracing and movement of the plugs.

11. Air for inflation of the triple connection pneumatic plug shall be supplied through a factory-equipped control panel. There shall be three hose connections from the control panel to the triple connection pneumatic plug. One hose shall be used only for inflation of the pneumatic plug. The second hose shall be used for continuously reading the air pressure rise in the sealed line.
12. There shall be a 3 ½” diameter, 0-30 psig gauge mounted on the control panel for reading the internal pressure of the line being tested. Calibrations from the 0-10 psig range shall be in tenths of pounds (not ounces) and this 0-10 portion shall cover 90% of the completed dial range.
13. Low pressure air shall be introduced into the sealed line until the internal air pressure reaches 4.0 psig greater than the average back pressure of any ground water pressures that may be over the pipe. At least two minutes shall be allowed for the air pressure to stabilize. After the stabilization period, the third hose shall be quickly disconnected from the control panel.
14. The portion of line being tested shall be accepted if the portion under test does not lose air at a rate greater than 0.0015 cfm per square foot of internal pipe surface when tested at an average pressure of 3.0 psig greater than any back pressure exerted by ground water that may be over the pipe at the time of the test.
15. The above requirement shall be accomplished by performing the test as follows. The time required in minutes for the pressure to decrease from 3.5 to 2.5 psig (greater than the average back pressure of any ground water that may be over the pipe) shall not be less than the time shown for the given diameters in the following table (See Table 3 this Section):

TABLE 3

PIPE DIAMETER INCHES	MINIMUM TIME MN: SEC	LENGTH FOR MINIMUM TIME FEET	TIME FOR LONGER LENGTHS SECONDS
4	3:46	597	3.380 L
6	5:40	398	0.654 L
8	7:34	298	1.520 L
10	9:25	239	2.374 L
12	11:20	189	3.418 L
15	14:10	159	5.342 L
18	17:00	133	7.692 L
21	19:50	114	10.470 L
24	22:40	99	13.574 L
27	25:30	88	17.306 L
30	28:20	80	21.366 L
33	31:10	72	25.852 L
36	34:00	66	30.768

16. In areas where ground water is known to exist, the Contractor shall install a ½” diameter capped pipe nipple, approximately 10 inches long, through the manhole

wall on top of on one of the sewer lines entering the manhole. This shall be done at the time the sewer line is installed. Immediately prior to the performance of the line acceptance test, the ground water level shall be determined by removing the pipe cap, blowing air through the pipe nipple into the ground so as to clear it, and then connecting a clear plastic tube to the pipe nipple. The hose shall be held vertically and a measurement of the height in feet of water shall be taken after the water stops rising in this plastic tube. The height in feet shall be divided by 2.3 to establish the pounds of pressure that will be added to readings.

17. If the installation fails to meet this requirement, the Contractor shall determine at his own expense the source of the leakage. He shall repair or replace all defective materials and/or workmanship. The use of sewer scaling materials and methods shall not be used or accepted.
18. There shall be no substitute for good construction. The replacement of any pipes, pipe or fraction thereof shall require the end connections to be made with factory manufactured pieces having flexible gasketed joints to fit intended use. The use of half bell pipe and/or concrete collar will not be acceptable. Test shall be repeated as often as necessary until the installation meets the requirements of the acceptance test.
19. Pipe Deflection: Each segment of P.V.C. sewer main shall be tested for deflection. The test shall consist of pulling a mandrel through each segment of P.V.C. pipe. The mandrel shall be an object having a cross-section, or same shall be a ball, having a diameter equal to 95% of the nominal pipe inside diameter. A steel cable of adequate known length and strength characteristics, shall be used to pull the mandrel through the piping. In the event of a failure, the failure location shall be found by measurement and the piping shall be repaired or replaced as required. After failure correction, the segment shall be re-tested. This process shall be repeated as often as necessary.

It is recommended that the test for deflection precede the test for infiltration and exfiltration. The Contractor shall furnish all equipment as required to perform all testing as specified. All tests shall be conducted in the presence of the Engineer.

20. After completion of aforementioned testing, each manhole shall be subjected to any exfiltration test. The manhole to be tested shall be isolated from the sewer lines by installing pneumatic plugs in the sewer lines using the same procedure as for air testing, except that the plugs shall be installed in such a manner that there is a clear distance of at least 18" between the inside face of the manhole and the face of the plug. The manhole shall be tested by one of the two methods discussed below.

9.3 WATER TEST

The manhole shall then be filled completely with water. Depth of water shall be at least 3' above ground water. A liquid level measurement shall be made and recorded after initial

filling and 15 and 30 minutes thereafter. The test is acceptable when the water loss observed is less than 0.1 gallon/foot diameter/foot head/hour. Addition of water during the testing shall not be allowed.

9.4 VACUUM TEST

All lift holes and any pipes entering the manhole are to be plugged. A vacuum will be drawn and the vacuum drop over a specified time period is used to determine the acceptability of the manhole. The values recorded are applicable only to the manhole being tested and at the time of testing.

The test results will be greatly affected by the preparation of the manhole. All lift holes shall be plugged completely. All pipes entering the manhole shall be temporarily plugged, taking care to securely brace the pipes and plugs to prevent them from being drawn into the manhole.

A. Procedure

1. The test head shall be placed at the top of the manhole in accordance with the manufacturer's recommendations.
2. A vacuum of 10 in. of mercury shall be drawn on the manhole, the valve on the vacuum line of the test head closed, and the vacuum pump shut off. The time shall be measured for the vacuum to drop to 9 in. of mercury.
3. The manhole shall pass if the time for the vacuum reading to drop from 10 in. of mercury to 9 in. of mercury meets or exceeds the values indicated in Table 1.
4. If the manhole fails the initial test, necessary repairs shall be made by an approved method. The manhole shall then be retested until a satisfactory test is obtained.

Minimum Test Times for Various Manhole Diameters – Vacuum Test – Table 1

Dept h (ft)	Diameter (Inches)								
	30	33	36	42	48	54	60	66	72
	Times (Seconds)								
8	11	12	14	17	20	23	26	29	33
10	14	15	18	21	25	29	33	36	41
12	17	18	21	25	30	35	39	43	49
14	20	21	25	30	35	41	48	51	57
18	22	24	30	34	40	45	52	58	67
18	25	27	32	35	45	52	58	65	73
20	28	30	35	42	50	53	65	72	81
22	31	33	39	45	55	54	72	79	89
24	33	36	42	51	59	64	78	87	97
26	38	39	46	55	64	75	85	94	110

									5
28	39	42	49	59	69	81	91	101	11
									3
30	42	45	53	63	74	87	98	108	12
									1

- 5 All sewer pipes shall be flushed to remove any debris, sand or grit from the completed sewers prior to being placed in service. The Contractor shall flush and pump or remove all water from the flushing process.
- 6 Each section of the sewer line between manholes is required to be straight and uniformly graded. Each section will be lamped in the presence of the Engineer.

PART 10 – TESTING OF

FORCE MAINS NOT USED

PART 11 – INITIAL CLEAN UP, GRADING, AND REPLACEMENT

The Contractor shall provide the necessary labor and equipment to permit initial clean up as the sewer main is being installed. Immediately following trench backfill, all areas disturbed by excavation shall be graded to conform to the adjacent ground levels. Earth shall be neatly mounded over the trench location. All debris, of whatever nature, due to the sewer main and service installation, shall be picked up and disposed of. All walks, driveways, roads, streets, etc., shall be replaced to original condition.

PART 12 – FINAL CLEAN UP, FINISH GRADING, SEEDING, AND STRAW

Following completion of the various routes and initial trench settlement, the Contractor shall go over the routes and clean-up all remaining debris. Following completion of the final clean up, all areas in any way disturbed by the installation shall be graded to conform to the adjacent ground areas. After final grading, the graded areas shall be seeded and covered with straw. In areas of rock excavation, it will be necessary to place a four-inch layer of earth over the exposed areas to form a seed bed for vegetation. The earth shall be applied as part of the final grading operation.

END OF SECTION 333000

SECTION 334000 – STORM DRAINAGE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Storm sewer drainage piping, fittings, and accessories.
 - 2. Storm drainage structures.

1.2 SUBMITTALS

- A. Product Data: Provide data on pipe materials, pipe fittings, and accessories. Provide shop drawings for precast inlets and catch basins
- B. Manufacturer's Certificate: Certify that products meet or exceed specified local requirements.
- C. Project Record Documents:
 - 1. Accurately record actual locations of pipe runs, connections, catch basins, cleanouts, and invert elevations.
 - 2. Identify and describe unexpected variations to subsoil conditions and location of uncharted utilities.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

- A. Reinforced Concrete Pipe (RCP): ASTM C76, Class III unless noted otherwise on Drawings, installed with flexible plastic, bitumen gaskets at joints.
 - 1. Gaskets: AASHTO M198, Type B or ASTM C443, installed in accordance with manufacturer's recommendations.
 - 2. Flared End Sections: ASTM C76, or for sections with toe wall, AASHTOH170.
- B. High Performance Polypropylene pipe (HP) shall conform to the following requirements:
 - 1. AASHTO M330, smooth interior and annular exterior. Pipe shall be installed in accordance with pipe manufacture's installation guidelines. Pipe shall meet all City Requirements.
 - 2. Joint and Fittings. Pipe joints and fittings shall conform to ASTM D3212, or be approved by the engineer. All joints and fittings to be water tight.

2.2 DRAINAGE STRUCTURES

- A. Catch Basins, Inlets, and Junction Boxes: Provide in accordance with details shown on Drawings and ASTM C-478.
- B. Lids and Frame: Provide in accordance with details shown on Drawings.
 - 1. Acceptable Manufacturers:
 - a. Neenah Foundry.
 - b. East Jordan Iron Works.
 - c. Bass & Hays Foundry.

- C. Cement Mortar used for paving inverts, filling lift holes, joints, patching and anchoring castings shall consist of one part Portland cement, type I, ASTM C150, 1/4 part hydrated lime, ASTM C206 and 2-1/2 parts clean, well-graded sand and water free of suspended matter, alkali, and containing no industrial or domestic waste.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that trench cut and excavation is ready to receive work and excavations, dimensions, and elevations are as indicated on Drawings.

3.2 PREPARATION

- A. Hand trim excavations to required elevations. Correct over-excavation with bedding material.
- B. Remove large stones or other hard matter that could damage piping or impede consistent backfilling or compaction.
- C. Protect benchmarks, property corners, and other survey monuments from damage or displacement. If marker needs to be removed it shall be referenced by licensed land surveyor and replaced, as necessary, by same.

3.3 INSTALLATION - PIPE

- A. The pipe shall be inspected for defects and cracks before being lowered into the trench, piece by piece. Any defective, damaged or unsound pipe or any pipe that has had its grade disturbed after laying shall be taken up and replaced. Open ends shall be protected with a stopper to prevent earth or other material from entering the pipe during construction. The interior of the pipe shall be free from dirt, excess water and other foreign materials as the pipe laying progresses and left clean at the completion of the installation.
- B. Excavate pipe trench and place bedding material in accordance with the Earthwork section.
- C. Install pipe in accordance with manufacturer's written recommendations.
- D. Reinforced Concrete Pipe: Pipe shall be installed in accordance with pipe manufacturer's installation Guidelines for Culvert Storm Drainage Applications.
- E. Installation shall commence at the lowest point for each segment of the route.
- F. Lay pipe to the required line and slope gradients with the necessary fittings, inlets, risers, structures, and other appurtenances placed at the required location as noted on Drawings.
- G. Do not displace or damage pipe when compacting.

- H. No pipe shall be laid in water or when trench conditions are unsuitable for such work.
- I. Joints:
 - 1. Joints shall be constructed as described herein and in accordance with manufacturer's installation instructions for soil tight joints.
 - 2. For RCP, the joint surface shall be cleaned and washed with water, if necessary, before the joints are made. For tongue and groove joints in smaller sizes, make joints butting the inside of the bell with a cement mortar before joining. The inside joint shall be wiped clean of excess mortar by brush or a squeegee drawn through the pipe as the laying operations progress. In the larger diameters, which permit the entry of a man, annular space between pipe sections shall be completely filled with mortar and finished off smooth with the inside surface of the pipe.
- J. All installation shall be in compliance with ASTM C1479.

3.4 INSTALLATION – CATCH BASINS, INLETS, AND JUNCTION BOXES

- A. Drainage structures shall be constructed in accordance with details shown on drawings.
- B. Precast Sections:
 - 1. Precast section with bases shall be installed in accordance with the Earthwork section or as shown on drawings.
 - 2. Pipe shall be properly aligned with connections to structures as shown on the drawings.
- C. Invert channels shall be smooth and accurately shaped to a semicircular bottom conforming to the inside of the adjacent sewer section. Invert channels and structure bottoms shall be shaped with cement mortar. Changes in size and grade of invert shall be made gradually and evenly. Changes in direction of the sewer entering branch or branches shall have a true curve of as large a radius as the manhole will permit.
- D. Frames and Covers:
 - 1. Frames and covers shall be set to the proper elevation. The frames shall be firmly embedded in mortar approximately 1 inch thick and aligned to fit the top section of the structure.
 - 2. Bricks set in mortar used to adjust the frame to finished grade shall be limited to no more than four courses.
 - 3. Adjustment rings used to make adjustments in grade shall be made with the initial ring embedded in mortar and the exterior of the rings parged with mortar not less than 1/2 inch thick. No adjustment made in this manner shall exceed 8 inches.

3.5 INSPECTION AND TESTING

- A. General:
 - 1. Storm sewer systems and culverts, upon completion or at such time as directed, shall be cleaned, inspected and tested. The system or culvert shall have a true grade and line. Actual elevations shall be within 0.08 feet of the elevations given on the drawings.

2. After completion of the Work, or any part thereof, the job shall be tested to determine that it has been installed in accordance with the drawings and specifications. In general, the Work shall prove to be in good condition, installed in accordance with the drawings and specifications and ready for use.
- B. Cleaning and Testing: Visibly inspect and remove all debris and obstructions from storm pipe. Test for infiltration and exfiltration by hydrostatic testing per ASTM C969. Manholes and pipe shall conform to ASTM C969 leakage criteria.
 - C. Alignment Test: After backfill has been placed and compacted to a depth not less than one foot above top of pipe, a visual inspection shall be made by flashing a light between manholes. Any displacement or misalignment of invert shall be corrected.

END OF SECTION 334000

APPENDIX A

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LOCATION MAP
(NOT TO SCALE)



Scale: 1"=100'

LEGEND

 Boring location

BORING PLAN
Babler State Park
Wildwood, Missouri

15595

Figure 1

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PROJECT NO. 15595

DATE: 5/18/23

LOCATION: See Figure 1

DEPTH, FT.	COMPLETION DEPTH 15 FT. BORING METHOD CFA ROCK CORE DIAMETER N/A IN. SURFACE ELEVATION 742 FT.	STRATUM DEPTH, FT.	SPT			PERCENT RECOVERY	ROCK CORE	Shear Strength from Indicated							
			SPLIT SPOON BLOWS/6 in. THREE 6-in. INCREMENTS	UNDISTURBED SAMPLE				1	2	3	4	5			
								○ Dry Density, pcf 90 100 110 120 130							
								□ Water Content, % Plastic Limit Liquid Limit							
								⊗ Standard Penetration Resistance, Blows/Ft. 10 20 30 40 50							
	Brown Silty Clay (CL)														
5	Brown Clay (CH) - trace rock fragments below 5 feet	3.0													
10	- increasing rock fragments below 7.5 feet														
15	- decreasing rock fragments below 11 feet														
15	Boring terminated at 15 feet	15.0													
20															
25															
30															
35															
WATER LEVEL OBSERVATIONS		NOTES													
DURING DRILLING	Dry FT.	Elevations estimated using Google Earth													
AT COMPLETION	Dry FT.														
AFTER	HRS. FT.														

PROJECT NO. 15595

DATE: 5/18/23

LOCATION:

See Figure 1

DEPTH, FT.	COMPLETION DEPTH 15 FT. BORING METHOD CFA ROCK CORE DIAMETER N/A IN. SURFACE ELEVATION 753 FT.	STRATUM DEPTH, FT.	SPT		PERCENT RECOVERY	ROCK CORE	Shear Strength from Indicated										
			SPLIT SPOON	UNDISTURBED SAMPLE			1	2	3	4	5						
							○	Dry Density, pcf									
								90	100	110	120	130					
								Water Content, %									
							Plastic Limit					Liquid Limit					
							⊗	Standard Penetration Resistance, Blows/Ft.									
							10	20	30	40	50						
5	2 in. Topsoil Brown Silty Clay (CL)																
10	- with some rock and weathered rock fragments below 6.5 feet - increasing rock fragments below 7.5 feet Brown Shale to Clayey Shale with some rock fragments	10.0															
15	- white to light gray below 13 feet Boring terminated at 15 feet	15.0															
20																	
25																	
30																	
35																	

WATER LEVEL OBSERVATIONS			NOTES
DURING DRILLING	Dry	FT.	Elevations estimated using Google Earth
AT COMPLETION	Dry	FT.	
AFTER	HRS.	FT.	

Shear Test Types - Static Cone: ● Pocket Penetrometer: ■ Unconf. Compr.: ▼ Miniature Vane: ▲ Field Vane: ◆

PROJECT NO. 15595

DATE: 5/18/23

LOCATION:

See Figure 1

DEPTH, FT.	COMPLETION DEPTH 15 FT. BORING METHOD CFA ROCK CORE DIAMETER N/A IN. SURFACE ELEVATION 753 FT.	STRATUM DEPTH, FT.	SPT			PERCENT RECOVERY	ROCK CORE	Shear Strength from Indicated								
			SPLIT SPOON BLOWS/6 in. THREE 6-in. INCREMENTS	UNDISTURBED SAMPLE												
								○ Dry Density, pcf 90 100 110 120 130	□ Water Content, % Plastic Limit Liquid Limit	⊗ Standard Penetration Resistance, Blows/Ft. 10 20 30 40 50						
5	4 in. Topsoil Brown Silty Clay (CL)															
10	Brown Clay (CH) with some weathered rock fragments - with highly weathered rock and rock fragments	7.5														
15	Boring terminated at 15 feet	15.0														
20																
25																
30																
35																
WATER LEVEL OBSERVATIONS		NOTES														
DURING DRILLING	Dry FT.	Elevations estimated using Google Earth														
AT COMPLETION	Dry FT.															
AFTER	HRS. FT.															

PROJECT NO. 15595

DATE: 5/18/23

LOCATION:

See Figure 1

DEPTH, FT.	COMPLETION DEPTH 28.5 FT. BORING METHOD CFA ROCK CORE DIAMETER N/A IN. SURFACE ELEVATION 748 FT.	STRATUM DEPTH, FT.	SPT		PERCENT RECOVERY	ROCK CORE	Shear Strength from Indicated								
			SPLIT SPOON BLOWS/6 in. THREE 6-in. INCREMENTS UNDISTURBED SAMPLE				1	2	3	4	5				
							○ Dry Density, pcf 90 100 110 120 130								
							□ Water Content, % Plastic Limit Liquid Limit								
							⊗ Standard Penetration Resistance, Blows/Ft. 10 20 30 40 50								
	2 in. Topsoil Brown Silty Clay (CL)														
5															
	Brown Clay (CH) with some rock and weathered rock fragments	5.5													
10															
	Weathered rock with some clay	9.5													
	Reddish-brown Clay (CH) and highly weathered rock with rock fragments	11.0													
	6 in. rock layer	13.0													
15		13.5													
	Brown to reddish-brown Clay (CH) with some rock fragments														
20															
25															
30	Boring terminated at 28.5 feet	28.5													
35															

WATER LEVEL OBSERVATIONS			NOTES
DURING DRILLING	Dry	FT.	Elevations estimated using Google Earth
AT COMPLETION	Dry	FT.	
AFTER	HRS.	FT.	

Shear Test Types - Static Cone: ● Pocket Penetrometer: ■ Unconf. Compr.: ▼ Miniature Vane: ▲ Field Vane: ◆

PROJECT NO. 15595

DATE: 5/18/23

LOCATION:

See Figure 1

DEPTH, FT.	COMPLETION DEPTH 25.5 FT. BORING METHOD CFA ROCK CORE DIAMETER N/A IN. SURFACE ELEVATION 748 FT.	STRATUM DEPTH, FT.	SPT		PERCENT RECOVERY	ROCK CORE	Shear Strength from Indicated								
			SPLIT SPOON BLOWS/6 in. THREE 6-in. INCREMENTS UNDISTURBED SAMPLE				1	2	3	4	5				
							○ Dry Density, pcf 90 100 110 120 130								
							□ Plastic Limit								
							⊗ Standard Penetration Resistance, Blows/Ft. 10 20 30 40 50								
5	2 in. Topsoil Brown Silty Clay (CL) - increasing rock and weathered rock fragment below 5 feet														
10	Rock and weathered rock with some brown clay Reddish-Brown Clay (CH) with weathered rock fragments	9.0 10.5													
15															
20															
25	- rock fragments increase below 23 feet Weathered rock and rock Auger refusal on rock at 25.5 feet	25.0 25.5													
30															
35															

WATER LEVEL OBSERVATIONS			NOTES
DURING DRILLING	Dry	FT.	Elevations estimated using Google Earth
AT COMPLETION	Dry	FT.	
AFTER	HRS.	FT.	

Shear Test Types - Static Cone: ● Pocket Penetrometer: ■ Unconf. Compr.: ▼ Miniature Vane: ▲ Field Vane: ◆

PROJECT NO. 15595

DATE: 5/18/23

LOCATION:

See Figure 1

DEPTH, FT.	COMPLETION DEPTH 17 FT. BORING METHOD CFA ROCK CORE DIAMETER N/A IN. SURFACE ELEVATION 753 FT.	STRATUM DEPTH, FT.	SPT			PERCENT RECOVERY	ROCK CORE	Shear Strength from Indicated										
			SPLIT SPOON BLOWS/6 in. THREE 6-in. INCREMENTS UNDISTURBED SAMPLE					Dry Density, pcf		Water Content, %		Standard Penetration Resistance, Blows/Ft.						
						90	100	110	120	130	10	20	30	40	50			
0 - 4	4 in. Topsoil Brown Silty Clay (CL)	5.0																
4 - 10	Brown Clay (CH) - trace rock fragments below 9 feet - rock fragments increase below 12 feet																	
10 - 16	- reddish-brown below 16 feet																	
16 - 17	Weathered rock and rock	16.5																
17 - 17.0	Auger refusal on rock at 17 feet	17.0																
17.0 - 20																		
20 - 25																		
25 - 30																		
30 - 35																		

WATER LEVEL OBSERVATIONS

NOTES

DURING DRILLING	Dry	FT.
AT COMPLETION	Dry	FT.
AFTER	HRS.	FT.

Elevations estimated using Google Earth

Shear Test Types - Static Cone: ● Pocket Penetrometer: ■ Unconf. Compr.: ▼ Miniature Vane: ▲ Field Vane: ◆

APPENDIX B

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Stormwater Pollution Prevention Plan (SWPPP)

For Construction Activities At:
[Dr. Edmund Babler State Park](#)
[800 Guy Park Dr.](#)
[Wildwood, MO](#)
[Project – X2312-01](#)

STATE OPERATING PERMIT NUMBER: MOR-100038

SWPPP Prepared For:
[State of Missouri](#)
[Michael L. Parson, Governor](#)

[Missouri Department of Natural Resources](#)
[Missouri State Parks](#)
[1659 E. Elm St.](#)
[P.O. Box 176](#)
[Jefferson City, MO 65102-0176](#)
[\(573\) 751-2479](#)
[MOPARKS@DNR.MO.GOV](#)

SWPPP Prepared By:
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[Elliott Reed](#)
[530A. E. Independence Drive](#)
[Union, MO 63084](#)
[636-584-0540](#)
[ereed@cochraneng.com](#)

Estimated Project Duration: [6 months](#)

SWPPP Preparation Date: [08/9/2023](#)

Estimated Project Start Date: [12/1/2023](#)

Estimated Project Completion Date: [06/1/2024](#)

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SECTION 1: NATURE OF CONSTRUCTION ACTIVITY

Instructions:

- Describe the function of the project and estimate the total area expected to be disturbed by tree removal, excavation, grading, or other construction activities, including, but not limited to, off-site borrow and fill areas.
- Provide a general description of the nature of the construction activities at your project.
- What is the size of the property (in acres), the total area expected to be disturbed by the construction activities (in acres), and the maximum area expected to be disturbed at any one time? Include the area needed for material production such as batch plants and storage of materials or piles.

General Description of Project

Missouri State Parks is upgrading 33 campsites located within the Dr. Edmund Babler State Park. Campsite upgrades include new concrete pads, electric, sanitary sewer, and water service. The site is located at 800 Guy Park Drive in Wildwood, MO.

Size of Construction Project

TOTAL ACREAGE OF PROPERTY: 21.34 Ac.

TOTAL ACREAGE TO BE DISTURBED BY ACTIVITY: 5.50 Ac.

Site Phasing

Site is to be developed in one phase.

Public Improvement Project *N/A*

- The site is associated with a Public Improvement Project.
- The Public Improvement is inside the area of disturbance.
- The Public Improvement is connected and continues outside of the area of disturbance.

1.1 Discharge Information

General Description of Stormwater Outfalls and Water Features found on Site (e.g., streams and sinkholes).

The campsite is located on top of a ridge. The road splits the drainage areas, resulting in a portion of the campsite flowing to the east and the remaining campsite flowing to the west. Storm water for both areas sheet flows down the hill into two unnamed tributaries that flow to Wild Horse Creek.

List Receiving Waters

Unnamed tributaries to Wild Horse Creek

1.2 Construction Support Activities

Instructions:

- Will there be any construction support activities for the project (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas)?
- Describe how the support activities will be contained and stormwater runoff prevented.

Description of construction support activity and BMPs used to prevent runoff.

Inlet protection, construction entrance, silt fence, check dams.

Support activity subcontractor:

COMPANY _____

NAME _____

ADDRESS _____

ADDRESS _____

CELL PHONE NUMBER _____

OFFICE PHONE NUMBER _____

EMAIL _____

SECTION 2: SWPPP TEAM CONTACT INFORMATION/RESPONSIBLE PARTIES

2.1 *Property Owner: Notification, Certification & Delegation of Authority to Contractor*

Instructions:

- The following certification statement must be signed and dated by the owner or legally authorized representative.
This person has authority to bind the company and signs Security Agreement contracts.
 - For a corporation, this could be a president, secretary, treasurer, or vice president, or any other person who performs similar policy or decision making functions for the corporation.
 - For a partnership or sole proprietorship, this could be a general partner or the proprietor.
 - For a municipality, state, federal or other public agency, this could be a principal executive officer or ranking elected official.
- This certification must be re-signed in the event of a SWPPP Modification.

Property Owner/Permittee:

Missouri Department of Natural Resources
Missouri State Parks
1659 E. Elm St.
P.O. Box 176
Jefferson City, MO 65102-0176
(573) 751-2479
moparks@dnr.mo.gov

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.

Submittal of the SWPPP and/or permit fee does not imply that the permit has been or will be authorized or issued. The permit fee will be adjusted according to the fee schedule if it's determined during the review process of the SWPPP that the area to be disturbed is more or less than that represented on the application.

I hereby certify that I am the legal owner of the property for which this permit is requested or his/her legally authorized agent.

OWNER: Please Print Name, Sign and Date

2.2 **CONTRACTOR GIVEN AUTHORITY: NOTIFICATION & CERTIFICATION**

Instructions:

- The designee is authorized if:
 - The authorization is made in writing by the individual making the designation.
 - The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as an operator, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company.
 - The signed and dated written authorization is included in the SWPPP.

Delegation of Authority

I, _____ (Owner/Permitee) hereby designate the person or specifically described position below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the Missouri State Operating Permit, at Dr. Edmund Babler State Park.

The designee is authorized to sign any reports, stormwater pollution prevention plans and all other documents required by the permit. This person will conduct inspections once a week and within 48 hours of stormwater event which causes runoff on-site and make corrective actions.

General Contractor:

Site Superintendent and/or designated Inspector #1 (makes decisions for corrective actions)

Name of person _____

Company _____

Cell Phone _____

Email _____

Site Superintendent and/or designated Inspector #2 (makes decisions for corrective actions)

Name of person _____

Company _____

Cell Phone _____

Email _____

(Repeat as needed for Contractor team.)

Delegation of Authority Continued

By signing this authorization, I confirm that I meet the requirements to make such a designation, and that the designee above meets the definition of a “duly authorized representative.”

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.

OWNER: Please Print Name, Sign and Date

**CONTRACTOR NOTIFICATION OF
STORMWATER POLLUTION PREVENTION PLAN**

While working at a permitted job-site, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP). Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract (if under a contractual agreement). You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is on-site and shall be made available upon request.

Each contractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the practices described in the SWPPP.

Site Superintendent and/or designated Inspector #1
CONTRACTOR: Please to Print Name, Sign and Date

Site Superintendent and/or designated Inspector #2
CONTRACTOR: Please Print Name, Sign and Date

2.3 *Additional Contractors: Notification & Certification*

Instructions:

- List the additional contractors expected to work on-site. Notify contractors of stormwater requirements applicable to their work.
- “Subcontractor” refers to any person or company performing work on-site for completion of the project, not just entities under contractual agreement.
- Only contractors performing activities which could impact stormwater quality (working in the dirt) need to be listed.

All additional Contractors must sign the Contractor Agreement Found in the Appendix.

Additional Contractors: Demolition, Excavation, Dirt Work, ESC Contractor, Plumbing & Utilities must sign the Contractor Agreement found in the appendix.

COMPANY OR ORGANIZATION NAME _____

NAME _____

ADDRESS _____

ADDRESS _____

CELL PHONE NUMBER _____

OFFICE PHONE NUMBER _____

EMAIL _____

COMPANY OR ORGANIZATION NAME _____

NAME _____

ADDRESS _____

ADDRESS _____

CELL PHONE NUMBER _____

OFFICE PHONE NUMBER _____

EMAIL _____

COMPANY OR ORGANIZATION NAME _____

NAME _____

ADDRESS _____

ADDRESS _____

CELL PHONE NUMBER _____

OFFICE PHONE NUMBER _____

EMAIL _____

Contractor Agreement

CONTRACTOR NOTIFICATION OF STORMWATER POLLUTION PREVENTION PLAN

While working at a permitted job-site, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP). Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract (if under a contractual agreement). You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is on-site and shall be made available upon request.

Each contractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the practices described in the SWPPP.

CONTRACTOR: Please Print Name, Sign and Date

CONTRACTOR: Please Print Name, Sign and Date

CONTRACTOR: Please Print Name, Sign and Date

CONTRACTOR: Please Print Name, Sign and Date

CONTRACTOR: Please Print Name, Sign and Date

CONTRACTOR: Please Print Name, Sign and Date

SECTION 3: TRAINING, INSPECTION AND CORRECTIVE ACTION

3.1 Training

Instructions:

The following personnel, at a minimum, must be trained, and therefore should be listed out individually in the table below:

- Person responsible for environmental matters
- Designated inspector (if different than above)

The Missouri State Operating Permit MORA00000 for land disturbance require the following: (1) The Permittee must designate a person responsible for environmental matters that has a thorough and demonstrable knowledge of the site's SWPPP and erosion and sediment control practices in general. (2) The Permittee is responsible for ensuring that the person who conducts inspections is a "qualified person", defined in MORA00000 as "a person knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, who possesses the skills to assess conditions at the construction site that could impact stormwater quality, and the skills to assess the effectiveness of any stormwater controls selected to control the quality of stormwater discharges from the construction activity."

Documentation of Completion of Training

Name	Date Training Completed

3.2 *Inspection Personnel and Procedures*

Instructions:

- Describe the procedures you will follow for conducting inspections.
- Describe the procedures you will follow for corrective action.
- The person/people conducting inspections and corrective actions must be delegated as the people/person of authority.
- **Site Superintendent and/or designated Inspector #1 and #2 are responsible for conducting inspections and corrective actions. This person may be determined after project is awarded and the schedule will be determined at that time by the contractor.**

Inspection Schedule:

Choice A

- **SELF INSPECTION FORM TO BE USED FOR THIS SITE IS IN THE APPENDIX.**
- Inspection will be done at least **once per 7 calendar days**. Inspections must also occur within 48 hours after any rain event equal to or greater than 3.10 inches (2 year, 24 hour storm) and has ceased during a normal work day and within 72 hours if the rain event ceases during a non-work day such as a weekend or holiday.

Choice B

- **SELF INSPECTION FORM TO BE USED FOR THIS SITE IS IN THE APPENDIX.**
- Inspection will be done at least once per **14 calendar days**. Inspections must also occur within 24 hours after any rain event equal to or greater than 0.25 inches or the occurrence of run off from snowmelt. If the storm event continues for multiple days and continues to accumulate 0.25 inches, you are required to conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the end of the storm.
- Inspections are only required during project normal working hours. Areas on-site that have been finally stabilized must be inspected at least once per month.

Corrective Action Schedule to be used for choice A and B

Any structural or maintenance problems shall be noted in an inspection report and corrected within seven calendar days of the inspection. If weather conditions prevent correction of BMPs within 7 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 7 day time period. The documentation must be filed with the regular inspection reports, and the problem shall be corrected as soon as weather conditions allow. The responsible person must be notified by phone, text or email when stormwater runoff occurs.

SECTION 4: Best Management Practices (BMPs) for Pollution Control

General Instructions:

- Describe the erosion and sediment controls that will be installed and maintained at your site.
- BMPs shall be maintained and remain in effective operating condition during the entire duration of the project.
- **Combine all BMP designs with phasing tables together on one large Detail Plan Sheet and include them on the Erosion Control site plans.**
- You shall design, install and maintain effective erosion, sediment and chemical controls to minimize the discharge of pollutants. At a minimum, such controls shall be designed, installed and maintained to:
 - Control storm water volume and velocity within the site to minimize soil erosion;
 - Control storm water discharges, including both peak flowrates and total storm water volume, to minimize erosion at outlets and to minimize downstream channel and streambank erosion;
 - Minimize the amount of soil exposed during construction activity;
 - Minimize the disturbance of steep slopes;
 - Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls shall address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting storm water runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site;
 - If feasible, provide and maintain a 50-foot undisturbed natural buffer around surface waters of the state, direct storm water to vegetated areas to increase sediment removal and maximize storm water infiltration. If it is infeasible to provide and maintain an undisturbed 50-foot natural buffer, you shall comply with the stabilization requirements for areas within 50 feet of a surface water; and
 - Minimize soil compaction and, unless infeasible, preserve topsoil.

4.1 Phasing of Construction Activities

Instructions:

- Describe the intended sequence and timing of activities that disturb soils at the site. For each phase of construction, include the following information:
 - Installation of stormwater filtering or damming, structural or non-structural Best Management Practices (BMPs) ;
 - Beginning and duration of earth-disturbing activities, including clearing and grubbing, demolition, mass grading, site preparation (i.e., excavating, cutting and filling), final grading, and creation of soil and vegetation stockpiles requiring stabilization;
 - Cessation, temporarily or permanently, of construction activities on the site, or in designated portions of the site;
 - Final or temporary stabilization of areas of exposed soil. The dates for stabilization must reflect applicable deadlines.
 - Make sure that the phases for installation of each BMP are consistent with installation dates in BMP Sections.
 - You determine how many phases are appropriate. Delete or add rows as necessary.
 - **Attach narrative descriptions for all selected BMPs in the following Sections that apply.**

Phase	Instructions, Tips & Tricks	Start Date	Construction Sequence	BMPs- Check the BMPs that will be installed and maintained.	End Date
Pre-Construction	<p><u>Initial BMPs are to be installed prior to any other activity on-site. Call City at 864-2087 for an initial BMP inspection as soon as this has been done.</u></p> <p>The following is needed to pass this inspection:</p> <ol style="list-style-type: none"> 1. Installation of Pre-con BMPs. 2. SWPPP on-site. 3. Site sign posted. <p>Upon successful completion of installation, a City Land Disturbance Permit will be issued. The hold on the building permit will also be released at this time. If a temporary sedimentation basin is required, the permit will be issued upon completion and inspection of the basin.</p>	_ / _ / _	a. Initial BMP & SWPPP Installations	<input type="checkbox"/> LDP Site Sign is displayed and SWPPP is stored where sign designates <input type="checkbox"/> Equipment/Material Yard established <input type="checkbox"/> Portable toilet <input type="checkbox"/> Trash dumpster <input type="checkbox"/> Construction exit <input type="checkbox"/> Perimeter control (sock, fence, or other) <input type="checkbox"/> Ditch Check <input type="checkbox"/> Check Dam <input type="checkbox"/> Tree protection fencing (install at least 10 feet from the drip line) <input type="checkbox"/> Access road (stabilized) <input type="checkbox"/> Inlet protection for existing inlets <input type="checkbox"/> BMP minimizing Endangered Species impact <input type="checkbox"/> BMP minimizing stormwater exposure to building materials containing PCBs during demolition	_ / _ / _

Phase	Instructions, Tips & Tricks	Start Date	Construction Sequence	BMPs- Check the BMPs that will be installed and maintained.	End Date
Phase 1: Demolition and Grading	<p>Demolition and tree removal is the first phase of construction.</p> <p>When removing vegetation, it is a good practice to chip some of the material on-site and apply as a mulch ground cover. The mulch protects the soil from the erosive impact of rainfall. It also protects the roots of remaining trees from soil compaction.</p> <p>Utilize fencing and/or signage to indicate preservation of vegetation.</p>	_/_/_	a. Demolition / Clearing	<input type="checkbox"/> Contain and cover building materials containing PCBs <input type="checkbox"/> Preservation of existing vegetation <input type="checkbox"/> Dust control <input type="checkbox"/> Street sweeping	_/_/_
	<p>If a sedimentation basin is called for, it should be installed with temporary outfall pipe and emergency spillway prior to any other grading activity.</p> <p>The State requires installation of a sedimentation basin for each drainage area with ten or more acres disturbed at one time. The basin shall be sized to contain a volume of at least 3,600 cubic feet per each disturbed acre draining thereto.</p>	_/_/_	b. Sedimentation Basins/traps	<input type="checkbox"/> Sedimentation basin <input type="checkbox"/> Sediment trap	_/_/_
	<p>It is always best to try to limit the area of disturbance at any given time. Rather than mass grading, leave areas of vegetation. A vegetated strip between limits of grading and the perimeter BMP both enhances the effectiveness of the perimeter control and increases its lifespan, as it is less likely to be damaged by equipment.</p> <p>Once a parking area has been graded, lay base-rock if possible. This will greatly cut down on track-out.</p> <p>Seed and stabilize stockpiles.</p> <p>Remember, vegetation is always the best BMP.</p>	_/_/_	c. Grading	<input type="checkbox"/> Soil binders <input type="checkbox"/> Retain topsoil <input type="checkbox"/> Stockpile protection <input type="checkbox"/> Slope drains <input type="checkbox"/> Stream crossing <input type="checkbox"/> Water diversion <input type="checkbox"/> Dewatering <input type="checkbox"/> Dust Control	_/_/_

Stormwater Pollution Prevention Plan (SWPPP)
Dr. Edmund Babler State Park

	<p>Consider the quantity of water that will need to be diverted and if the water is saturated with clay, it will need to be filtered with a BMP.</p> <p>Consider clean water in and clean water out. Try to completely bypass clean water beyond the work area.</p> <p>Cut trees off to a stump and leave it in place. The stumps and roots provide bank stability. As it decomposes, more vegetation will take root.</p> <p>Earthen coffer dams are not excepted.</p>	_/_/_	d. Stream Alteration	<input type="checkbox"/> Stream Diversion <input type="checkbox"/> Water Bypass Pipe <input type="checkbox"/> Dewatering Work Area <input type="checkbox"/> Flush Cut Tree Removal while leaving stump and roots <input type="checkbox"/> Cofferdam <input type="checkbox"/> Berm <input type="checkbox"/> Stream Crossing	_/_/_
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Phase	Instructions, Tips & Tricks	Start Date	Construction Sequence	BMPs- Highlight/Circle BMPs that will be installed/maintained during the associated phase	End Date
Phase 2: Construction	As stormwater system becomes active, protect new inlets. Add ditch checks, check dams, and erosion control blanket as specified in the plan.	_/_/_	a. Drainage System Installation	<input type="checkbox"/> Ditch checks <input type="checkbox"/> Check dams <input type="checkbox"/> Inlet protection for new inlets	_/_/_
	Make sure that communication is happening between you and your utility contractor. If they will need to access within a tree preservation zone, discuss alternatives to trenching, such as boring.	_/_/_	b. Utilities Installation	<input type="checkbox"/> Sign subcontractor agreement	_/_/_
	All wash-out pits should be lined in plastic.	_/_/_	c. Paving	<input type="checkbox"/> Concrete wash-out pit	_/_/_
	Windblown trash and debris is considered a pollutant.	_/_/_	d. Building Construction	<input type="checkbox"/> Plastic lined masonry area <input type="checkbox"/> Trash Dumpster	_/_/_

Stormwater Pollution Prevention Plan (SWPPP)
Dr. Edmund Babler State Park

	<p>These BMPs include bioretention, infiltration trenches, pervious pavement, and pavers, etc.</p> <p>If these features become clogged with sediment and/or compacted by equipment, they will not function properly.</p>	_/_/_	e. Permanent BMP Installations	<input type="checkbox"/> Prevent soil compaction <input type="checkbox"/> Protect permanent structures <input type="checkbox"/> Remediate soils	_/_/_
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Phase	Instructions, Tips & Tricks	Start Date	Construction Sequence	BMPs- Check the BMPs that will be installed and maintained.	End Date
Phase 3: Stabilization	<p>Stabilization must be initiated immediately and completed within seven (7) calendar days where soil disturbing activities have temporarily ceased on any portion of the site and will not resume for a period exceeding fourteen (14) calendar days. Interim stabilization shall consist of well established and maintained BMPs.*</p> <p><u>*Temporary stabilization is met with functioning perimeter control BMPs.</u></p>	_/_/_	a. Temporary Stabilization	<input type="checkbox"/> Hydroseed, <input type="checkbox"/> Seed/straw <input type="checkbox"/> Sod <input type="checkbox"/> Perimeter control BMPs <input type="checkbox"/> Seed mix used: <input type="checkbox"/> Turf reinforcement mat <input type="checkbox"/> Erosion control blanket	_/_/_
	<p>Final stabilization of disturbed areas must be initiated immediately and completed within seven (7) calendar days whenever any clearing, grading, excavating, or other earth disturbing activities have permanently ceased on any portion of the site.</p> <p>To prevent the loss of topsoil, seed and straw, utilize temporary BMPs such as: erosion control blanket, turf reinforcement mat, ditch checks, and perimeter control.</p>	_/_/_	b. Permanent Stabilization	<input type="checkbox"/> Hydroseed <input type="checkbox"/> Seed/straw <input type="checkbox"/> Sod <input type="checkbox"/> Seed mix used: <input type="checkbox"/> Turf reinforcement mat <input type="checkbox"/> Erosion control blanket <input type="checkbox"/> Other method controlling the movement of top soil (please describe)	_/_/_

4.2 Natural Buffers

Instructions:

- Preserve existing vegetation where practical.
- A minimum of a 50-ft buffer of undisturbed natural vegetation should be provided between disturbed portions of the site and surrounding surface waters. You must show the 50-foot boundary line of the natural buffer on your Erosion Sediment Control (ESC) plan. Show on your ESC plan how any discharge will first be treated prior to entering the natural buffer and if velocity dissipation devices will be used to prevent erosion.
- If Buffer disturbances are authorized as part of in-stream work under a US Army Corps Engineers (USACE) Clean Water Act (WCA) Section 404 permit, no further documentation is required for Section 4.1 of the Template. Attach CWA Section 404 Permit. This exception only applies to the limits of disturbance authorized under the Section 404 permit, and does not apply to any upland portion of the construction project.
- Indicate preservation of existing vegetation by including boundaries on site map.

Will any areas of vegetation in addition to areas associated with surface water buffers be preserved during construction?

YES, this project will practice preservation of existing vegetation as a non-structural BMP.

NO, existing vegetation that is not associated with surface water buffers will be preserved.

Are there any surface waters within 50 feet of your project's earth disturbances?

No (If no, no further documentation is required for the SWPPP Template.)

Yes, I will provide and maintain a 50-foot undisturbed natural buffer as per ESC plan.

Yes, however I will NOT provide and maintain an undisturbed natural buffer of any size.

Yes, however buffer disturbances are authorized as part of in-stream work under an Army Corps Section 404 permit found in Appendix.

Yes and buffer disturbances will occur for the construction of a water-dependent structure or water access area (e.g., pier, boat ramp, and trail).

4.3 Tree and Vegetation Preservation

Instructions:

- Determine if any trees will be preserved during this project. Tree preservation is as an example of non-structural BMPs. If applicable, include a tree preservation plan in the Appendix under Site Plans.
- Indicate all trees that will be preserved on your erosion control site map or on a separate tree preservation plan

Check box if section is NOT applicable.

- Trees to be preserved are noted on the demolition plan.

Best Management Practice # 1

Description:

- Trees will be protected with orange construction fencing located at the dripline of the tree.

4.4 Perimeter Controls

Instructions:

- Describe sediment controls used to eliminate sediment from being moved in a sheet flow or channelized flow during a rain event.
- If there is a portion of the perimeter with no sheet flow, slope or channelized runoff, a vegetated buffer of 8 ft can be substituted as perimeter control.

Check box if section is NOT applicable.

Best Management Practice # 1

Description: Straw Wattle

- Location and detail of the straw wattle are shown on the Erosion and Sediment Control plans, reference sheets C129-131.

4.5 Sediment Track-Out

Instructions:

- Describe stormwater controls that will be used to minimize the track-out of sediment onto off-site streets, other paved areas, and sidewalks from vehicles exiting your construction site.

Check box if section is NOT applicable.

Best Management Practice # 1

Description: Street Cleaning

- Street cleaning to include shoveling, sweeping, and/or vacuuming to remove track-out of sediment from paved public roads. Cleaning shall be performed as soon as possible, end of the work day, and before rain events. If sediment is free of trash/debris, and be removed back into the project. Otherwise, waste shall be disposed of in a solid water dumpster on or off-site. Sediment shall NOT be washed into any storm or sanitary sewer.

4.6 Soil, Materials and Borrow/Fill sites

Instructions:

- Describe stormwater controls and other measures you will take to minimize the discharge of sediment or soil particles from stockpiled sediment or soil. Include a description of structural practices (e.g., diversions, berms, ditches, storage basins), including design, installation, and maintenance specifications used to divert flows from stockpiled sediment or soil, retain or detain flows, or otherwise limit exposure and the discharge of pollutants from stockpiled sediment or soil.
- Describe how topsoil will be preserved and identify these areas and control measures on your site map(s).
- Indicate if a borrow/fill site will be used for the project and provide information of permitted or non permitted site.

Check box if section is NOT applicable.

Borrow/fill sites (excavated material disposal areas, borrow areas)

Excess soil will be disposed of:

On-site

- Off-site area is covered under this project's permit numbers and will be stabilized following construction as per the stabilization plan.
- Off-site area will not be stabilized following construction, a separate permit is needed.

4.7 *Minimization of Dust*

Instructions:

- o Describe controls and procedures you will use at your project/site to minimize the generation of dust.

Check box if section is NOT applicable.

Best Management Practice # 1

Description:

- Minimizing disturbance of the site and use of water trucks, mulching, wind barriers, and soil binders to suppress dust. Work shall be phased to limits the disturbance of area at one time. Soil binders shall only be used in area of sheet flow. Binders shall be installed in accordance with the manufacturer's specification.

4.8 *Minimization of Disturbance of Steep Slopes*

Instructions:

- o Describe how you will minimize the disturbance to steep slopes. A steep slope is greater than 3:1 (three feet horizontal to one foot vertical) or greater than 3% AND greater than 150 feet in length.
- o Describe controls (e.g., erosion control blankets, tackifiers), including design, installation and maintenance specifications, that will be implemented to minimize sediment discharges from slope disturbances.

Check box if section is NOT applicable.

Best Management Practice # 1

Description:

- Slopes greater than 3:1 are not anticipated for this site.
- Silt fence and temporary seeding will be used to minimize erosion on steep slopes. SWPPP inspector and GC shall inspect for erosion after storm events and restabilize as necessary.

4.9 *Stormwater Control Measures*

Instructions:

- Examples of Stormwater Control Measures: Basins, Swales, Rain Gardens, Pervious Paving and Bioretention Features.
- In areas where final vegetative stabilization or infiltration practices will be installed, describe the control measures, design, and installation. Include maintenance specifications that will be used to restrict vehicle or equipment access and preservation of top soil for future seeding.

Check box if section is NOT applicable.

Best Management Practice # 1

Description:

4.10 Storm Drain Inlets

Instructions:

- Describe controls that will be implemented to protect all inlets that will receive stormwater from your construction activities and that you have authority to access.

Check box if section is NOT applicable.

Best Management Practice # 1

Description: N/A

4.11 Constructed Stormwater Conveyance Channels

Instructions:

- If you will be installing a stormwater conveyance channel, describe control practices (e.g. velocity dissipation devices) that will be implemented at the construction site.

Check box if section is NOT applicable

Best Management Practice # 1

Description: N/A

4.12 Sediment Basins and Sediment Traps

Instructions:

- A sedimentation basin will be provided for each drainage area with 10 or more acres disturbed at one time. The basin shall be sized to contain a volume of at least 3,600 cubic feet per disturbed acre draining thereto. Include design specifications for each basin including volume, dimensions and outlet structure.
- Sediment basins must also utilize outlet structures that withdraw water from the surface unless infeasible.
- Temporary and permanent sedimentation basins must have a stabilized spillway to minimize the potential for erosion of the spillway or basin embankment.
- Accumulated sediment shall be removed from the basin when the basin is 50% full. The basin shall be maintained until final stabilization of the disturbed area served by the basin.
- If use of a sediment basin is impractical, similarly effect BMPs must be chosen and employed to control erosion and sediment delivery. These similarly effective BMPs must provide equivalent water quality protection.
- Sediment traps are smaller and do not require a temporary outfall structure. However, a dewatering plan may be required to empty traps, such as a pump with filtering BMP.

Check box if section is NOT applicable

Best Management Practice # 1

Description: N/A

4.13 Treatment Chemicals and Flocculants

Instructions:

- Provide details below if you are using treatment chemicals (polymers, flocculants, etc.) at your site.

Check box if section is NOT applicable.

Treatment Chemicals

List all treatment chemicals that will be used at the site:

Describe the dosage of all treatment chemicals you will use at the site or the methodology you will use to determine dosage:

Provide information from any applicable Material Safety Data Sheets (MSDS):

Describe how each of the chemicals will stored:

Schematic Drawings of Stormwater Controls/Chemical Treatment Systems

Provide schematic drawings of any chemically-enhanced stormwater controls or chemical treatment systems to be used for application of treatment chemicals:

Training

Describe the training that personnel who handle and apply chemicals have received prior to permit coverage, or will receive prior to the use of treatment chemicals:

Best Management Practice # 1

Description: N/A

4.14 Allowable Non-Stormwater Discharges

Instructions:

- Identify all allowable sources of non-stormwater discharges including:
 - Water only (i.e., without detergents or additives) rinsing of streets and buildings; and
 - Site watering to establish vegetation.

Check box if section is NOT applicable.

Fire hydrant flushing

Landscape irrigation

Potable water including uncontaminated water line flushing

Routine external building wash off waters

Pavement wash off waters through a BMP

4.15 Dewatering Practices and Water Diversions

Instructions:

- If you will be discharging sediment water that is removed from excavations, trenches, foundations, vaults, or other similar points of accumulation, include design specifications and details of all dewatering practices.
- When working within a waterway, it may be necessary to divert water around the job site using a berm, pipe, or pump structure. This is an ideal BMP as it keeps the work area dry and water is not exposed to sediment.

Check box if section is **NOT** applicable.

Best Management Practice # 1

Description: N/A

4.16 Wash Water (Paving, Concrete, Stucco, Paint and Equipment/Vehicle)

Instructions:

- Describe how you will minimize the discharge of pollutants from wash waters and process water associated with paint, concrete and mortar activities.
- Describe equipment/vehicle washing practices that will be used to minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water and other types of washing (e.g. locating activities away from surface waters and stormwater inlets or conveyances, directing wash waters to a sediment basin or sediment trap, using filtration devices such as filter bags or sand filters, or using other similarly effective controls).

Check box if section is **NOT** applicable.

Paving Operations- Sediment, Oils & Grease, Trash, Debris, Solids

Concrete Wash-Out and Cement Waste- Heavy Metals, pH (acids and bases), Trash, Debris, Solids

Structure Construction, Stucco, Painting and Cleaning- Heavy Metals, pH (acids and bases), Trash, Debris, Solids, Toxic Chemicals

Equipment/Vehicle Washing- Sediment, Heavy Metals, pH (acids and bases), Oils & Grease, Trash, Debris, Solids, Toxic Chemicals

Best Management Practice # 1

Description:

- All washwater shall be directed into a leakproof container or pit. The container shall be designed so no overflow can occur due to inadequate sizing or precipitation. Washout shall be located as far away as possible from surface water/inlets. The container/pit shall be cleaned or replaced when volume is reduced by 85% to prevent potential overflow in a storm event.
- All sand, cement, and materials shall be located within an identified area. Runoff control, such as diversion berms, silt fence/dike shall be provided to prevent migration of stormwater pollutants from the mason's area.
- Materials to be stored in waterproof containers. Except during application, containers and the contents must be kept in trucks or inside of storage facilities. Runoff containing such material shall be collected, removed from the site, treated, and disposed of at an approved waste facility.

4.17 Fuel, Oil, and Petroleum Products (Equipment and Vehicles)

Instructions:

- All fueling will adhere to applicable federal and state regulations concerning underground storage, above ground storage and dispensing.
- Describe how you will minimize the discharge of pollutants from fuel, oil, and petroleum products associated with equipment and vehicles.
- Describe fueling, storage and mechanic practices that will be used to minimize the discharge of pollutants (e.g. locating activities away from surface waters and stormwater inlets or conveyances, containing activities with plastic liners, using filtration devices such as filter bags or sand filters, or using other similarly effective controls).
- Implement chemical spill and leak prevention and response procedures. These procedures include but are not limited to maintenance of spill kits, installation of containment berms, and use of drip pans at petroleum product and liquid storage tanks and containers.

Check box if section is not applicable.

Fueling- pH (acids and bases), Oils & Grease, Toxic Chemicals

Equipment Maintenance- Sediment, Nutrients, Heavy Metals, pH (acids and bases), Pesticides/Herbicides, Oils & Grease, Trash, Debris, Solids, Toxic Chemicals

Other Toxic Chemicals

Best Management Practice # 1

Description:

- Fuel, oil, and other petroleum products will not be stored below the ordinary high water mark at any time or in the adjacent floodway beyond normal working hours. All fueling facilities present on the site shall adhere to applicable federal and state regulations concerning underground storage, above ground storage, and dispensers. All fuel, oil, and other fluids exposed to precipitation shall be stored in watertight, structurally sound, closed containers.
- Minimize the discharge of fluids from spills and leaks by implementing chemical spill and leak prevention and response procedures, including, but not limited to, installation of containment berms and use of drip pans.
- Machinery will be kept out of the waterway as much as possible.
- No fueling, servicing, maintenance or repair of equipment or machinery should be done within 100 feet of a stream, or within 150 feet of a classified stream, losing stream, or sinkhole.
- Tarps or drop cloths and drip pads should be used when servicing, repairing, or performing maintenance on construction equipment in the field.
- When work is complete, the contaminated materials should be disposed of appropriately.

4.18 Chemical Storage, Handling and Spill Response

Instructions:

- All chemicals will adhere to applicable federal and state regulations concerning storage and dispensing.
- Describe how you will minimize the discharge of pollutants from chemicals associated with construction activities.
- Describe storage and dispensing practices that will be used to minimize the discharge of pollutants (e.g. locating activities away from surface waters and stormwater inlets or conveyances, containing activities with plastic liners, using filtration devices such as filter bags or sand filters, or using other similarly effective controls).
- Describe the spill response plan for minor and major spills over 25 gallons.
- Implement chemical spill and leak prevention and response procedures. These procedures include but are not limited to maintenance of spill kits, installation of containment berms, and use of drip pans and liquid storage tanks and containers.

Check box if section is not applicable.

- Material/Chemical Delivery and Storage- Sediment, Nutrients, Heavy Metals, pH (acids and bases), Oils & Grease, Trash, Debris, Solids, Toxic Chemicals
- Material/Chemical Use During Building Process- Nutrients, Heavy Metals, pH (acids and bases), Oils & Grease, Trash, Debris, Solids, Toxic Chemicals
- Other Polluting Material/Chemical Used During Construction Process-

Best Management Practice #1

Description:

- Location and contents of spill kit will be printed on Site Sign. Spill kit on-site will be kept with equipment necessary for spill clean-up. Equipment and materials include, but are not limited to: brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sawdust, and trash containers.
- Missouri, state law will be followed. It requires the responsible party to report releases greater than 50 gallons to the Missouri Department of Natural Resources at the earliest practical moment after discovery. If the release is from an underground storage tank, or UST, or piping, the reportable quantity is 25 gallons or more. Reports are also required for above ground storage tanks, or AST, that have released 50 gallons or greater. Further, federal law requires the responsible party to report any release of oil if the oil reaches or threatens any waterway. Any such spills or petroleum or other chemicals are to be reported as soon as possible to the Missouri Department of Natural Resources. Call the Southwest Regional Office at (417) 891-4300 or the Department's 24-hour Environmental Emergency Response number at (573) 634-2436
- Hazardous wastes shall comply with Missouri Hazardous Waste Laws and Regulations. For guidance, contact 1-800-361-4827
- Post guidelines for proper handling, storage and disposal of materials, and emergency spill cleanup on site.
- An accurate, up-to-date inventory of materials delivered and stored on-site will be kept.
- Retain original labels and material safety data sheets.
- All paint, solvents, petroleum products, petroleum waste products and storage containers such as drums, cans, or cartons shall be stored using best management practices.
- Materials exposed to precipitation shall be stored in watertight, structurally sound, closed containers with proper labels.
- Store bagged and boxed materials on pallets.
- Cover bagged and boxed materials during non-working days and prior to rain events.
- Incompatible materials, such as ammonia and chlorine, must not be stored in the same temporary containment facility.
- Containers for proper disposal of waste paints, solvents, and cleaning compounds shall be provided.

4.19 Pesticides, Herbicides, Insecticides, Fertilizers, and Landscape Materials

Instructions:

- Exposure of these chemicals to precipitation and stormwater on-site should be minimized.
- Implement chemical spill and leak prevention and response procedures. These procedures include but are not limited to maintenance of spill kits, installation of containment berms, and use of drip pans at petroleum product and liquid storage tanks and containers.

Check box if section is not applicable.

- Chemical Use During Landscaping Operations- Sediment, Nutrients, Pesticides, Herbicides, Insecticides, Fertilizers, Trash, Debris, Solids, Toxic Chemicals
- Material/Chemical Delivery and Storage- Sediment, Nutrients, Heavy Metals, pH (acids and bases), Oils & Grease, Trash, Debris, Solids, Toxic Chemicals
- Other Polluting Chemicals Used During Landscaping Process

Best Management Practice #1

Description:

- Hazardous wastes shall comply with Missouri Hazardous Waste Laws and Regulations. For guidance, contact 1-800-361-4827
- An accurate, up-to-date inventory of materials delivered and stored on-site will be kept.
- Retain original labels and material safety data sheets.
- Products and storage containers such as drums, cans, or cartons shall be stored using best management practices.
- Materials exposed to precipitation shall be stored in watertight, structurally sound, closed containers with proper labels.
- Store bagged and boxed materials on pallets.
- Cover bagged and boxed materials during non-working days and prior to rain events.
- Incompatible materials, such as ammonia and chlorine, must not be stored in the same temporary containment facility.
- Containers for proper disposal of waste shall be provided.

4.20 Waste Management (*Trash and Recycling Dumpster, Portable Toilet*)

Instructions:

- Describe how you will control the pollutants from solid waste and Sanitary waste.
 - Examples include: packaging materials, scrap construction materials, masonry products, timber, pipe, and electrical cuttings, plastics, Styrofoam, concrete, and other trash or building materials.)
 - Avoid locating sanitary facilities on impervious surfaces

Check box if section is **NOT** applicable.

- Solid Waste Disposal- Trash, Debris, Solids, Toxic Chemicals
- Portable Toilet - Nutrients, pH (acids and bases), Bacteria & Viruses

Best Management Practice #1

Description:

- Place waste receptacles near area of work.
- Cover receptacles and empty on a regular basis.
- Storage and collection areas will be located onsite in an area that does not receive a substantial amount of runoff from upland areas and does not drain directly to the City's stormwater system or a natural waterway.

Best Management Practice #2

Description:

- Portable toilet facilities to serve the number of workers on the site will be supplied.
- Portable toilet facilities will not be placed on top of storm inlets, outfalls or near waterways.
- Portable toilet facilities will be properly installed and fastened as per manufacturers specifications.

SECTION 5: SITE STABILIZATION

5.1 *Temporary Stabilization*

Instructions:

- Describe the specific vegetative and/or non-vegetative practices that will be used to stabilize exposed soils where construction activities have ceased.
- Interim stabilization must be initiated immediately and completed within 7 calendar days where soil disturbing activities have temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days for sites disturbing 5 acres or less at any time. For sites over 5 acres stabilization must occur within 7 calendar days. Interim stabilization shall consist of well established and maintained BMPs.
- Sites discharging to sensitive waters must stabilize within 7 calendar days.
- Final stabilization of disturbed areas must be initiated immediately and completed within 7 calendar days whenever any clearing, grading, excavating or other earth disturbing activities have permanently ceased on any portion of the site.
- Allowances to the 7 day completion period for temporary and final stabilization may be made due to weather and equipment malfunctions. Use of allowances shall be documented in the SWPPP.

Stabilization practices selected (select all that apply):

- BMPs
- Seed and Straw
- Hydroseed
- Tackifier/Soil Binder
- Other:

Best Management Practice # 1

Description:

- Seed shall be free of weedy species and appropriate for regional climate. Seed/mulch shall be installed immediately after topsoil is applied and final grade achieved. Vegetated areas must be watered, fertilized, and reseeded as needed. Vegetative density must be maintained throughout project completion.
- All disturbed areas must be stabilized temporarily with fast germinating annual grass. Alternative stabilization measures to seeding, such as anchored mulch may be utilized during period when vegetative growth is unlikely.
- Seeded areas shall be protected with straw mulch, hydraulic mulch, or rolled erosion control product. Straw mulch must be tackified or crimped by disc or other machinery, and rolled erosion control products must be installed per manufacturer's requirement

5.2 *Final Permanent Stabilization*

Instructions:

- Describe the vegetative and/or non-vegetative practices that will be used to stabilize exposed soils where construction activities have permanently ceased.
- The seeded area shall be maintained as necessary to assure growth for a two-week period after application. Seeding shall be placed from September 1 to November 15 and March 15 to May 31 unless otherwise authorized by the Engineer. If a project is completed except for seeding and this project completion occurs during the period when seeding is not allowed, the contractor will be required to complete all seeding and have confirmed growth within thirty (30) calendar days after the next seeding period begins.

Stabilization practices (select all that apply):

- | | |
|--|------------------------------------|
| <input checked="" type="checkbox"/> Concrete/Asphalt | <input type="checkbox"/> Hydroseed |
| <input type="checkbox"/> Mulch | <input type="checkbox"/> Sod |
| <input checked="" type="checkbox"/> Seed and Straw | <input type="checkbox"/> Other: |

Best Management Practice # 1

Description:

- The site will be stabilized by a combination of pavement, and seed and straw.

5.3 Explanation for Delayed Completion of Stabilization

Instructions:

- Only use this page if uncontrollable circumstances have delayed the initiation or completion of stabilization.
- Insert a description of circumstances that prevent you from stabilizing site with mulch, grass, rock, etc., as well as the schedule you will follow for initiating and completing stabilization.

Check box if section is NOT applicable.

Justification

Stabilization practice selected:

- | | |
|--|--|
| <input type="checkbox"/> Tackifier/Soil Binder | <input checked="" type="checkbox"/> Mulch |
| <input type="checkbox"/> Sod | <input checked="" type="checkbox"/> Seed and Straw |
| <input type="checkbox"/> Concrete/Asphalt | <input checked="" type="checkbox"/> Hydroseed |
| <input type="checkbox"/> Other | |

Best Management Practice # 1

Description: Area of delayed construction will be stabilized by either seed/straw, or mulch.

SECTION 6: PERMIT TERMINATION OR RENEWAL

6.1 Directions for Permit Termination

Instructions:

- To terminate a permit the following activities must be completed:
 - EITHER the project site is stabilized with perennial vegetation, pavement, buildings or structures using permanent materials over all areas that have been disturbed. With respect to the areas that have been vegetated, vegetation coverage is at least 70% plant density over 100% of the site. Temporary erosion and sediment control BMPs are no longer found on the site and any source of pollution to the City's MS4, such as sediment in storm water boxes, mud on public streets, solid waste issues, etc. have been removed.
 - OR the Permittee sold the permitted site to an entity who has obtained a new land disturbance permit. The SWPPP has been amended to show the area is no longer under the original permit's jurisdiction.

SECTION 7: DOCUMENTATION OF COMPLIANCE WITH OTHER FEDERAL REQUIREMENTS

7.1 *US Army Corps of Engineers (USACE) Clean Water Act (WCA) Section 404 permit Cover Page*

Instructions:

- Section 404 of the Clean Water Act (CWA) establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands.
- Obtain USACE permits at their regulatory program website (<http://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/Obtain-a-Permit/>)
- Provide the cover page of the general permit. General permits are usually valid for five years and may be re-authorized by USACE. Do not include the entire permit in the SWPPP.

Check box if section is **NOT** applicable.

7.2 *Missouri State Operating Permit MORA00000*

Instructions:

- Obtain a new land disturbance permit from the Missouri Department of Natural Resources ePermitting website (<http://dnr.mo.gov/env/wpp/epermit/help.htm>)
- Provide the cover page of the Missouri State Operating Permit. Do not include the entire permit in the SWPPP.

[Attached in Appendix.](#)

7.3 *Endangered Species Protection*

Instructions:

- This SWPPP does not supersede compliance with the Endangered Species Act.
- Results from both requested reports need to be included in this section. Projects must be reviewed on U.S. Fish and Wildlife Service's (USFWS) Information for Planning and Conservation (IPaC) website (<http://ecos.fws.gov/ipac/>) AND Missouri Department of Conservation's (MDC) Natural Heritage Review website (<https://naturalheritagereview@mdc.mo.gov>).
- For suitable habitat definitions refer to USFW IPaC report.
- If disturbances May affect, describe BMPs used to minimize impact.
- The applicant assumes all risk of violating section 9 of the ESA. Take is prohibited and cannot be mitigated without an Incidental Take Permit (ITP). To get an ITP, a Habitat Conservation Plan (HCP) is required. The only option to proceed without risk of violating section 9 is to avoid take or apply for an HCP.
- For further directions regarding the IPaC Report (may affect determination and when a project does not involve a federal authority) contact: karen_herrington@fws.gov, (573) 234-2132 ext: 166
- For further directions regarding the Natural Heritage Review (Level Two and Three) contact: NaturalHeritageReview@mdc.mo.gov, 573-522-4115 ext: 3182

USFWS's Official Species List determination:

Project is reviewed under the US Army Corps 404 Permit process.

May affect:

- Will impact suitable bat habitat (live trees and standing snags which possess exfoliating bark and/or cavities, cracks and crevices).

- Will remove any suitable bat habitat during the active season between the periods of April 1st - October 31st.
 - Impact subterranean features such as caves/mine shafts/springs.
- No effect** (April 1st - October 31st, AND no suitable habitat)

Missouri Natural Heritage Review Response:

Level One response:

There are no known records of Species and Natural Communities of Conservation Concern within the project area. No further coordination with the Missouri Department of Conservation is necessary.

Level Two response:

Records of state-listed Species and Natural Communities of Conservation Concern occur within or near the project area. Please contact the Missouri Department of Conservation for further coordination and information.

Level Three response:

Records of federal, and possibly also state-listed Species and Natural Communities of Conservation Concern occur within or near the project area. Please contact the Missouri Department of Conservation for further coordination and information. In addition, further coordination and consultation with the U.S. Fish and Wildlife Service for USFWS trust resources including Endangered Species Act species, is necessary. Please visit the U.S. Fish and Wildlife Website – Information for Planning and Conservation at <https://ecos.fws.gov/ipac/> for additional information or contact the USFWS.

7.4 *Historic Preservation*

Instructions:

- Under Section 106 of the National Historic Preservation Act, federal agencies must consider the effect of their actions on historic properties and provide the federal Advisory Council on Historic Preservation (ACHP) the opportunity to comment on proposed actions.
 - To successfully complete Section 106 review via website (<https://dnr.mo.gov/shpo/sectionrev.htm>), Federal agencies must:
 - gather information to decide which properties in the project area **are listed in or eligible for listing in the National Register of Historic Places**;
 - if so, determine how these historic properties might be affected;
 - explore alternatives to avoid or reduce harm to historic properties; and
 - reach agreement with the State Historic Preservation Office (SHPO) and the ACHP in some cases, on measures to deal with any adverse effects or obtain advisory comments from the ACHP, which are sent to the head of the agency.

Check box if section is not applicable.

Historic properties were located; however, they do NOT meet the eligibility standards for listing in the National Register of Historic Places

Historic properties were located which meet the eligibility standards for listing in the National Register of Historic Places

Historic properties may meet requirements for National Register Listing; Phase II testing is recommended

APPENDIX

A. US Army Corps Engineers (USACE) Clean Water Act (WCA) Section 404 permit Cover Page

B. Missouri State Operating Permit MORA00000 Cover Page

C. Endangered Species Protection IPaC and Natural Heritage Review Documents

D. State Historic Preservation 106 Review Documents

E. Self-Inspection Form

F. Site Maps, Plans and Details Sheet

G. Site Sign

***Appendix A: US Army Corps Engineers (USACE) Clean Water Act (CWA) Section 404 permit
Cover Page,***

Not Applicable for this project.

Appendix B: Missouri State Operating Permit MORA00000 Cover Page

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MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Michael L. Parson
Governor

Dru Buntin
Director

August 1, 2022

Leanne Mattern
Office of Administration, Facilities Management Design & Construction
Harry S. Truman SOB,
301 West High Street, Room 730
Jefferson City, MO 65102

Dear Permittee:

Pursuant to the Federal Water Pollution Control Act, under the authority granted to the State of Missouri and in compliance with the Missouri Clean Water Law, we have issued and are enclosing your Missouri State Operating Permit for Office of Administration, MOR-100038.

Please read and review your permit and attached Standard Conditions. They contain important information on site management and reporting requirements. Quarterly reports required by this report must be submitted through our eDMR system.

This permit may include requirements with which you may not be familiar. If you would like The Department of Natural Resources to meet with you to discuss how to satisfy the permit requirements, an appointment can be set up by contacting the permit writer at 573-526-1139. These visits are called Compliance Assistance Visits and focus on explaining the requirements to the permit holder.

This permit is both your Federal NPDES Permit and your new Missouri State Operating Permit and replaces all previous State Operating Permits issued for this facility under this permit number. In all future correspondence regarding this facility, please refer to your State Operating Permit number and facility name as shown on page one of the permit.

If you were adversely affected by this decision, you may be entitled to an appeal before the Administrative Hearing Commission (AHC) pursuant to 10 CSR 20-1.020 and 10 CSR 20-6.020; RSMo Section 621.250, 640.013, and 644.051.6. 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. Contact information for the AHC is: Administrative Hearing Commission, Truman State Office Building, Room 640, 301 W. High Street, P.O. Box 1557, Jefferson City, Missouri 65102, phone: (573) 751-2422, fax: (573) 751-5018; website: <http://ahc.mo.gov/>.

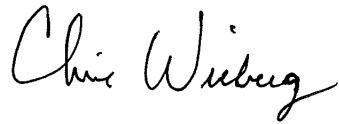


Office of Administration
Page Two

Please be aware that this facility may also be subject to any applicable county or other local ordinances or restrictions. If you have any questions concerning this permit, please do not hesitate to contact the Water Protection Program at P.O. Box 176, Jefferson City, MO 65102, 573-522-4502.

Sincerely,

WATER PROTECTION PROGRAM

A handwritten signature in black ink that reads "Chris Wieberg". The signature is written in a cursive style with a large initial "C" and a long, sweeping underline.

Chris Wieberg
Director

CW/qs

Enclosure

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 MOR100038

Owner: OA-Facilities Mgmt, Design, and Construc
Address: 301 West High Street, Hst Rm 370
Jefferson City, MO 65101

Continuing Authority: OA Facilities Mgmt Design Construction
301 West High St.
HST SOB Rm 730
Jefferson City, MO 65102

Facility Name: Office of Administration
Facility Address: OA-FMDC, PO Box 809 301 W High street
JEFFERSON CITY, MO 65102

Legal Description: Land Grant 02681, Cole County
UTM Coordinates: 571840.000/4270368.000
Receiving Stream: Tributary to Wears Creek (U)
First Classified Stream - ID#: 100K Extent-Remaining Streams (C) 3960.00
USGS# and Sub Watershed#: 10300102 - 1304

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.

August 01, 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(1)(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, 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; 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.

Table A	Schedule for Quarterly Reporting
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:

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

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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 1st 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_able.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, 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. For more information visit; 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

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, dnr.generalpermits@dnr.mo.gov

Appendix C: Endangered Species Protection IPaC and Natural Heritage Review Documents



Missouri Department of Conservation

Missouri Department of Conservation's Mission is to protect and manage the forest, fish, and wildlife resources of the state and to facilitate and provide opportunities for all citizens to use, enjoy and learn about these resources.

Natural Heritage Review Level Three Report: Species Listed Under the Federal Endangered Species Act

There are records of species listed under the Federal Endangered Species Act, and possibly also records for species listed Endangered by the state, or Missouri Species and/or Natural Communities of Conservation Concern within or near the the defined Project Area. Please contact the U.S. Fish and Wildlife Service and the Missouri Department of Conservation for further coordination.

Foreword: Thank you for accessing the Missouri Natural Heritage Review Website developed by the Missouri Department of Conservation with assistance from the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, Missouri Department of Transportation and NatureServe. The purpose of this report is to provide information to federal, state and local agencies, organizations, municipalities, corporations, and consultants regarding sensitive fish, wildlife, plants, natural communities, and habitats to assist in planning, designing, and permitting stages of projects.

PROJECT INFORMATION

Project Name and ID Number: Babler State Park #13176

User Project Number: X2312-01

Project Description: Missouri State Parks is upgrading 33 campsites located within the Dr. Edmund Babler State Park. Campsite upgrades include new concrete pads, electric, sanitary sewer, and water service. The site is located at 800 Guy Park Drive in Wildwood, MO. Water flows to two unnamed tributaries that flow to Wild Horse Creek.

Project Type: Recreation, Campgrounds/parking lots, playgrounds, Maintenance of existing facilities

Contact Person: Ryan Schweissguth

Contact Information: rschweissguth@cochraneng.com or 6365840540

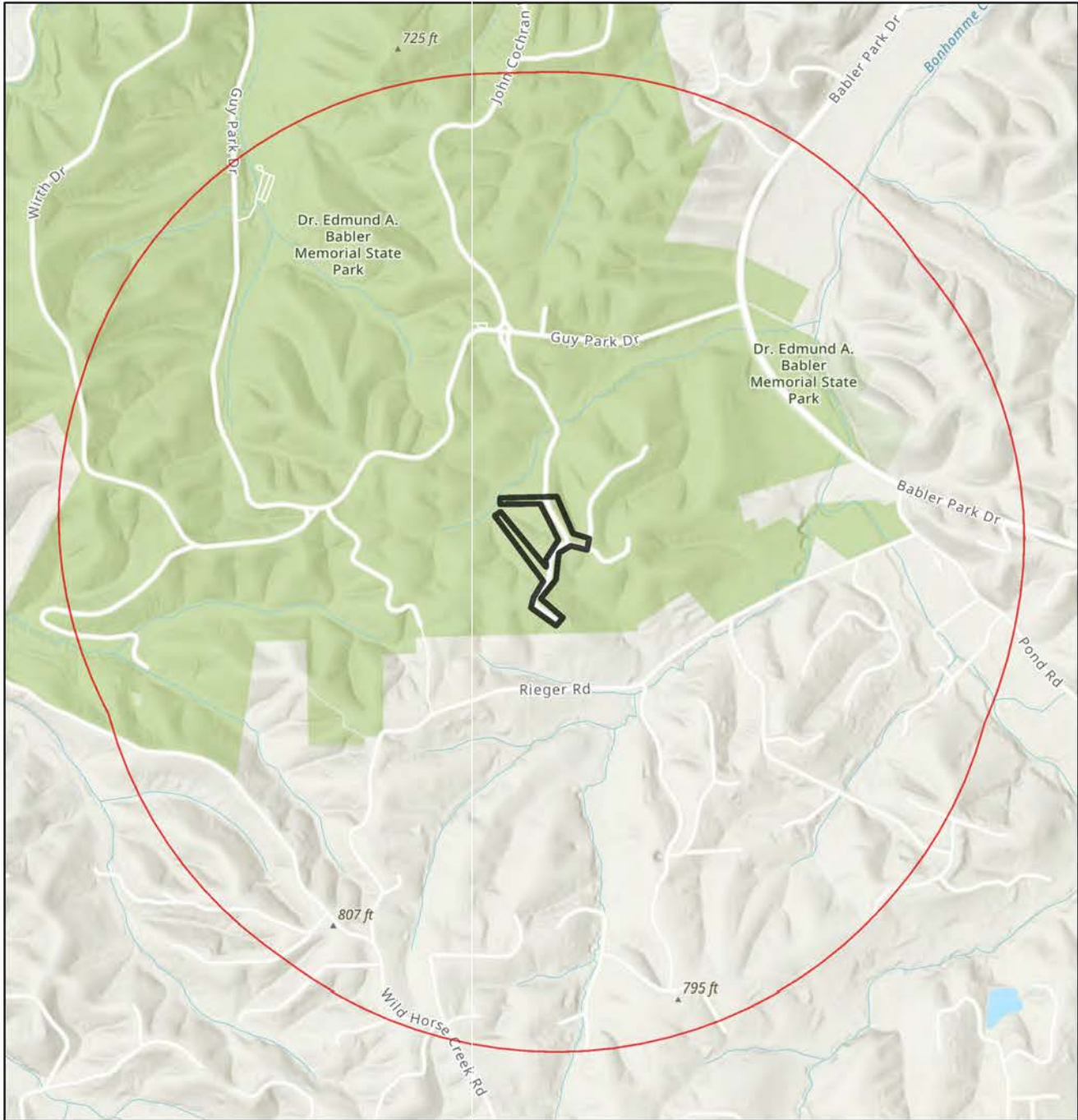
Disclaimer: This NATURAL HERITAGE REVIEW REPORT identifies if a species or natural community tracked by the Natural Heritage Program is known to occur within or near the project area submitted, and shares recommendations to avoid or minimize project impacts to sensitive species or natural habitats. Incorporating information from the Natural Heritage Program into project plans is an important step in reducing impacts to Missouri's sensitive natural resources. If an occurrence record is present, or the proposed project might affect federally listed species, the user must contact the Department of Conservation or U.S. Fish and Wildlife Service for more information.

This Natural Heritage Review Report is not a site clearance letter for the project. Rather, it identifies public lands and records of sensitive resources located close to and/or potentially affected by the proposed project. If project plans or location change, this report may no longer be valid. Because land use conditions change and animals move, the existence of an occurrence record does not mean the species/habitat is still present. Therefore, reports include information about records near but not necessarily on the project site. Lack of an occurrence record does not mean that a sensitive species or natural community is not present on or near the project area. On-site verification is the responsibility of the project. However, the Natural Heritage Program is only one reference that should be used to evaluate potential adverse project impacts and additional information (e.g. wetland or soils maps, on-site inspections or surveys) should be considered. Reviewing current landscape and habitat information, and species' biological characteristics would additionally ensure that Missouri Species of Conservation Concern are appropriately identified and addressed in planning efforts.

U.S. Fish and Wildlife Service – Endangered Species Act (ESA) Coordination: Lack of a Natural Heritage Program occurrence record for federally listed species in your project area does not mean the species is not present, as the area may never have been surveyed. Presence of a Natural Heritage Program occurrence record does not mean the project will result in negative impacts. This report does not fulfill Endangered Species Act consultation with the U.S. Fish and Wildlife Service (USFWS) for listed species. Direct contact with the USFWS may be necessary to complete consultation and it is required for actions with a federal connection, such as federal funding or a federal permit; direct contact is also required if ESA concurrence is necessary. Visit [IPaC: Home \(fws.gov\)](https://www.fws.gov/ipac) to initiate USFWS Information for Planning and Conservation (IPaC) consultation. Contact the Columbia Missouri Ecological Field Services Office (573-234-2132, or by mail at 101 Park Deville Drive, Suite A, Columbia, MO 65203) for more information.



Transportation Projects: If the project involves the use of Federal Highway Administration transportation funds, these recommendations may not fulfill all contract requirements. Please contact the Missouri Department of Transportation at 573-526-4778 or visit [Home Page | Missouri Department of Transportation \(modot.org\)](https://www.modot.org) for additional information on recommendations.

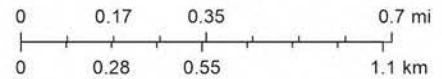
Babler State Park



August 10, 2023

1:20,832

-  Buffered Project Boundary
-  Project Boundary



Esri, NASA, NGA, USGS, FEMA, County of St. Louis, Missouri Dept. of Conservation, Missouri DNR, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA

Species or Communities of Conservation Concern within the Area:

There are records of species listed under the Federal Endangered Species Act, and possibly also records for species listed Endangered by the state, or Missouri Species and/or Natural Communities of Conservation Concern within or near the defined Project Area. Please contact the U.S. Fish and Wildlife Service and the Missouri Department of Conservation for further coordination.

Email (preferred): NaturalHeritageReview@mdc.mo.gov
MDC Natural Heritage Review
Science Branch
P.O. Box 180
Jefferson City, MO
65102-0180
Phone: 573-522-4115 ext. 3182

U.S. Fish and Wildlife Service
Ecological Service
101 Park Deville Drive
Suite A
Columbia, MO
65203-0007
Phone: 573-234-2132

Other Special Search Results:

The project occurs on or near public land, Dr. Edmund A. Babler Memorial State Park, please contact DNR.

Your project is near a designated Natural Area . Please contact Missouri Department of Conservation (NaturalHeritageReview@mdc.mo.gov) for further coordination.

Project Type Recommendations:

Recreation: Campgrounds -New and Maintenance construction should be managed to minimize erosion and sedimentation/runoff to nearby streams and lakes, including adherence to any Clean Water Act permit conditions. Project design should include stormwater management elements that assure storm discharge rates to streams for heavy rain events will not increase from present levels. Revegetate disturbed areas to minimize erosion using native plant species compatible with the local landscape and wildlife needs. Annual ryegrass may be combined with native perennials for quicker green-up. Avoid aggressive exotic perennials such as crownvetch and sericea lespedeza.

Project Location and/or Species Recommendations:

Endangered Species Act Coordination - If this project has the potential to alter habitat (e.g. tree removal, projects in karst habitat) or cause direct mortality of bats, please coordinate directly with U.S. Fish and Wildlife Service (Ecological Services, 101 Park Deville Drive, Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132 Ext. 100 for Ecological Services) for further coordination under the Endangered Species Act. Indiana bats (*Myotis sodalis*, federal- and state-listed endangered) and Northern long-eared bats (*Myotis septentrionalis*, federal-listed threatened) may occur near the project area. Both of these species of bats hibernate during winter months in caves and mines. During the summer months, they roost and raise young under the bark of trees in wooded areas, often riparian forests and upland forests near perennial streams. During project activities, avoid degrading stream quality and where possible leave snags standing and preserve mature forest canopy. Do not enter caves known to harbor Indiana bats or Northern long-eared bats, especially from September to April.

Gray Bat: The submitted project location is within the range of the Gray Myotis (i.e., Gray Bat) in Missouri. Depending on habitat conditions of your project's location, Gray Myotis (*Myotis grisescens*, federal and state-listed endangered) could occur within the project area, as they forage over streams, rivers, lakes, and reservoirs. Avoid entry or disturbance of any cave inhabited by Gray Myotis and when possible retain forest vegetation along the stream and from the cave opening to the stream. Please see [Best Management Practices for Construction and Development Projects Gray bat \(mo.gov\)](#).

Karst: This county has known karst geologic features (e.g., caves, springs, and sinkholes, all characterized by subterranean water movement). Few karst features are recorded in Natural Heritage records, and ones not noted here may be encountered at the project site or affected by the project. Cave fauna (many of which are Species of Conservation Concern) are influenced by changes to water quality; please check your project site for any karst features and make every effort to protect groundwater in the project area. Additional information and specific recommendations are available at [Management Recommendations for Construction and Development Projects Affecting Missouri Karst Habitat \(mo.gov\)](#).

Invasive exotic species are a significant issue for fish, wildlife and agriculture in Missouri. Seeds, eggs, and larvae may be moved to new sites on boats or construction equipment. Please inspect and clean equipment thoroughly before moving between project sites. See [Managing Invasive Species in Your Community | Missouri Department of Conservation \(mo.gov\)](#) for more information.

- Remove any mud, soil, trash, plants or animals from equipment before leaving any water body or work area.
- Drain water from boats and machinery that have operated in water, checking motor cavities, live-well, bilge and transom wells, tracks, buckets, and any other water reservoirs.
- When possible, wash and rinse equipment thoroughly with hard spray or HOT water (>140° F, typically available at do-it-yourself car wash sites), and dry in the hot sun before using again.

Streams and Wetlands – Clean Water Act Permits: Streams and wetlands in the project area should be protected from activities that degrade habitat conditions. For example, soil erosion, water pollution, placement of fill, dredging, in-stream activities, and riparian corridor removal, can modify or diminish aquatic habitats. Streams and wetlands may be protected under the Clean Water Act and require a permit for any activities that result in fill or other modifications to the site. Conditions provided within the U.S. Army Corps of Engineers (USACE) Clean Water Act Section 404 permit ([Kansas City District Regulatory Branch \(army.mil\)](#)) and the Missouri Department of Natural Resources (DNR) issued Clean Water Act Section 401 Water Quality Certification ([Section 401 Water Quality Certification | Missouri Department of Natural Resources \(mo.gov\)](#)), if required, should help minimize impacts to the aquatic organisms and aquatic habitat within the area. Depending on your project type, additional permits may be required by the Missouri Department of Natural Resources, such as permits for stormwater, wastewater treatment facilities, and confined animal feeding operations. Visit [Wastewater Permits | Missouri Department of Natural Resources \(mo.gov\)](#) for more information on DNR permits. Visit both the USACE and DNR for more information on Clean Water Act permitting.

For further coordination with the Missouri Department of Conservation and the U.S. Fish and Wildlife Services, please see the contact information below:

Email (preferred): NaturalHeritageReview@mdc.mo.gov
MDC Natural Heritage Review
Science Branch
P.O. Box 180
Jefferson City, MO
65102-0180
Phone: 573-522-4115 ext. 3182

U.S. Fish and Wildlife Service
Ecological Service
101 Park Deville Drive
Suite A
Columbia, MO
65203-0007
Phone: 573-234-2132

Miscellaneous Information

FEDERAL Concerns are species/habitats protected under the Federal Endangered Species Act and that have been known near enough to the project site to warrant consideration. For these, project managers must contact the U.S. Fish and Wildlife Service Ecological Services (101 Park Deville Drive Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132; Fax 573-234-2181) for consultation.

STATE Concerns are species/habitats known to exist near enough to the project site to warrant concern and that are protected under the Wildlife Code of Missouri (RSMo 3 CSR 1 0). "State Endangered Status" is determined by the Missouri Conservation Commission under constitutional authority, with requirements expressed in the Missouri Wildlife Code, rule 3CSR 1 0-4.111. Species tracked by the Natural Heritage Program have a "State Rank" which is a numeric rank of relative rarity. Species tracked by this program and all native Missouri wildlife are protected under rule 3CSR 10-4.110 General Provisions of the Wildlife Code.

See [Missouri Species and Communities of Conservation Concern Checklist \(mo.gov\)](#) for a complete list of species and communities of conservation concern. Detailed information about the animals and some plants mentioned may be accessed at [Mofwis Search Results](#). Please contact the Missouri Department of Conservation to request printed copies of any materials linked in this document.



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Missouri Ecological Services Field Office
101 Park Deville Drive
Suite A
Columbia, MO 65203-0057
Phone: (573) 234-2132 Fax: (573) 234-2181

In Reply Refer To:
Project Code: 2023-0115323
Project Name: Babler State Park

August 10, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Threatened and Endangered Species

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and may be affected by your proposed project. The species list fulfills the requirement for obtaining a Technical Assistance Letter from the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. **Note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days.** The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

Consultation Technical Assistance

Refer to the Midwest Region [S7 Technical Assistance](#) website for step-by-step instructions for making species determinations and for specific guidance on the following types of projects:

projects in developed areas, HUD, pipelines, buried utilities, telecommunications, and requests for a Conditional Letter of Map Revision (CLOMR) from FEMA.

Federally Listed Bat Species

Indiana bats, gray bats, and northern long-eared bats occur throughout Missouri and the information below may help in determining if your project may affect these species.

Gray bats - Gray bats roost in caves or mines year-round and use water features and forested riparian corridors for foraging and travel. If your project will impact caves, mines, associated riparian areas, or will involve tree removal around these features – particularly within stream corridors, riparian areas, or associated upland woodlots –gray bats could be affected.

Indiana and northern long-eared bats - These species hibernate in caves or mines only during the winter. In Missouri the hibernation season is considered to be November 1 to March 31. During the active season in Missouri (April 1 to October 31) they roost in forest and woodland habitats. Suitable summer habitat for Indiana bats and northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥ 5 inches diameter at breast height (dbh) for Indiana bat, and ≥ 3 inches dbh for northern long-eared bat, that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Tree species often include, but are not limited to, shellbark or shagbark hickory, white oak, cottonwood, and maple. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of other forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat and evaluated for use by bats. If your project will impact caves or mines or will involve clearing forest or woodland habitat containing suitable roosting habitat, Indiana bats or northern long-eared bats could be affected.

Examples of unsuitable habitat include:

- Individual trees that are greater than 1,000 feet from forested or wooded areas;
- Trees found in highly-developed urban areas (e.g., street trees, downtown areas);
- A pure stand of less than 3-inch dbh trees that are not mixed with larger trees; and
- A stand of eastern red cedar shrubby vegetation with no potential roost trees.

Using the IPaC Official Species List to Make No Effect and May Affect Determinations for Listed Species

1. If IPaC returns a result of “There are no listed species found within the vicinity of the project,” then project proponents can conclude the proposed activities will have **no effect** on any federally listed species under Service jurisdiction. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records. An example ["No Effect" document](#) also can be found on the S7 Technical Assistance website.
-

2. If IPaC returns one or more federally listed, proposed, or candidate species as potentially present in the action area of the proposed project – other than bats (see #3 below) – then project proponents can conclude the proposed activities **may affect** those species. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain [Life History Information for Listed and Candidate Species](#) through the Species website.
3. If IPaC returns a result that one or more federally listed bat species (Indiana bat, northern long-eared bat, or gray bat) are potentially present in the action area of the proposed project, project proponents can conclude the proposed activities **may affect** these bat species **IF** one or more of the following activities are proposed:
 - a. Clearing or disturbing suitable roosting habitat, as defined above, at any time of year;
 - b. Any activity in or near the entrance to a cave or mine;
 - c. Mining, deep excavation, or underground work within 0.25 miles of a cave or mine;
 - d. Construction of one or more wind turbines; or
 - e. Demolition or reconstruction of human-made structures that are known to be used by bats based on observations of roosting bats, bats emerging at dusk, or guano deposits or stains.

If none of the above activities are proposed, project proponents can conclude the proposed activities will have **no effect** on listed bat species. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records. An example "[No Effect](#)" document also can be found on the S7 Technical Assistance website.

If any of the above activities are proposed in areas where one or more bat species may be present, project proponents can conclude the proposed activities **may affect** one or more bat species. We recommend coordinating with the Service as early as possible during project planning. If your project will involve removal of over 5 acres of suitable forest or woodland habitat, we recommend you complete a Summer Habitat Assessment prior to contacting our office to expedite the consultation process. The Summer Habitat Assessment Form is available in Appendix A of the most recent version of the [Range-wide Indiana Bat Summer Survey Guidelines](#).

Other Trust Resources and Activities

Bald and Golden Eagles - Although the bald eagle has been removed from the endangered species list, this species and the golden eagle are protected by the Bald and Golden Eagle Act and the Migratory Bird Treaty Act. Should bald or golden eagles occur within or near the project area please contact our office for further coordination. For communication and wind energy projects, please refer to additional guidelines below.

Migratory Birds - The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Service. The Service has the responsibility under the MBTA

to proactively prevent the mortality of migratory birds whenever possible and we encourage implementation of recommendations that minimize potential impacts to migratory birds. Such measures include clearing forested habitat outside the nesting season (generally March 1 to August 31) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

Communication Towers - Construction of new communications towers (including radio, television, cellular, and microwave) creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. However, the Service has developed [voluntary guidelines for minimizing impacts](#).

Transmission Lines - Migratory birds, especially large species with long wingspans, heavy bodies, and poor maneuverability can also collide with power lines. In addition, mortality can occur when birds, particularly hawks, eagles, kites, falcons, and owls, attempt to perch on uninsulated or unguarded power poles. To minimize these risks, please refer to [guidelines](#) developed by the Avian Power Line Interaction Committee and the Service. Implementation of these measures is especially important along sections of lines adjacent to wetlands or other areas that support large numbers of raptors and migratory birds.

Wind Energy - To minimize impacts to migratory birds and bats, wind energy projects should follow the Service's [Wind Energy Guidelines](#). In addition, please refer to the Service's [Eagle Conservation Plan Guidance](#), which provides guidance for conserving bald and golden eagles in the course of siting, constructing, and operating wind energy facilities.

Next Steps

Should you determine that project activities **may affect** any federally listed species or trust resources described herein, please contact our office for further coordination. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

If you have not already done so, please contact the Missouri Department of Conservation (Policy Coordination, P. O. Box 180, Jefferson City, MO 65102) for information concerning Missouri Natural Communities and Species of Conservation Concern.

We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

John Weber

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether

any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Missouri Ecological Services Field Office

101 Park Deville Drive

Suite A

Columbia, MO 65203-0057

(573) 234-2132

PROJECT SUMMARY

Project Code: 2023-0115323

Project Name: Babler State Park

Project Type: Recreation - Maintenance / Modification

Project Description: Missouri State Parks is upgrading 33 campsites located within the Dr. Edmund Babler State Park. Campsite upgrades include new concrete pads, electric, sanitary sewer, and water service. The site is located at 800 Guy Park Drive in Wildwood, MO.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@38.609243750000005,-90.68693332884075,14z>



Counties: St. Louis County, Missouri

ENDANGERED SPECIES ACT SPECIES

There is a total of 6 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Gray Bat <i>Myotis grisescens</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6329	Endangered
Indiana Bat <i>Myotis sodalis</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949 General project design guidelines: https://ipac.ecosphere.fws.gov/project/HT6L7OQQDFANBKS5GTNVM3ZQ4M/documents/generated/6868.pdf	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045 General project design guidelines: https://ipac.ecosphere.fws.gov/project/HT6L7OQQDFANBKS5GTNVM3ZQ4M/documents/generated/6868.pdf	Endangered
Tricolored Bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

FLOWERING PLANTS

NAME	STATUS
Decurrent False Aster <i>Boltonia decurrens</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7705	Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Ryan Schweissguth
Address: 530A E. Independence Drive
City: Union
State: MO
Zip: 63084
Email: rschweissguth@cochraneng.com
Phone: 6365840540

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United States Department of the Interior



FISH AND WILDLIFE SERVICE
Missouri Ecological Services Field Office
101 Park Deville Drive
Suite A
Columbia, MO 65203-0057
Phone: (573) 234-2132 Fax: (573) 234-2181

In Reply Refer To:
Project code: 2023-0115323
Project Name: Babler State Park

August 10, 2023

Federal Nexus: no
Federal Action Agency (if applicable):

Subject: Technical assistance for 'Babler State Park'

Dear Ryan Schweissguth:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on August 10, 2023, for 'Babler State Park' (here forward, Project). This project has been assigned Project Code 2023-0115323 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements are not complete.**

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project.

Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat Rangewide Determination Key (Dkey), invalidates this letter. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid.***

Determination for the Northern Long-Eared Bat

Based upon your IPaC submission and a standing analysis, your project is not reasonably certain to cause incidental take of the northern long-eared bat. Unless the Service advises you within 15 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the Action is not likely to result in unauthorized take of the northern long-eared bat.

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination for the northern long-eared bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Decurrent False Aster *Boltonia decurrens* Threatened
- Gray Bat *Myotis grisescens* Endangered
- Indiana Bat *Myotis sodalis* Endangered
- Monarch Butterfly *Danaus plexippus* Candidate
- Tricolored Bat *Perimyotis subflavus* Proposed Endangered

You may coordinate with our Office to determine whether the Action may cause prohibited take of the animal species and/or critical habitat listed above. Note that if a new species is listed that may be affected by the identified action before it is complete, additional review is recommended to ensure compliance with the Endangered Species Act.

Next Steps

Coordination with the Service is complete. This letter serves as technical assistance. All conservation measures should be implemented as proposed. Thank you for considering federally listed species during your project planning.

We are uncertain where the northern long-eared bat occurs on the landscape outside of known locations. Because of the steep declines in the species and vast amount of available and suitable forest habitat, the presence of suitable forest habitat alone is a far less reliable predictor of their presence. Based on the best available information, most suitable habitat is now expected to be unoccupied. During the interim period, while we are working on potential methods to address this uncertainty, we conclude take is not reasonably certain to occur in areas of suitable habitat where presence has not been documented.

If no changes occur with the Project or there are no updates on listed species, no further consultation/coordination for this project is required for the northern long-eared bat. However, the Service recommends that project proponents re-evaluate the Project in IPaC if: 1) the scope, timing, duration, or location of the Project changes (includes any project changes or amendments); 2) new information reveals the Project may impact (positively or negatively) federally listed species or designated critical habitat; or 3) a new species is listed, or critical habitat designated. If any of the above conditions occurs, additional coordination with the Service should take place before project implements any changes which are final or commits additional resources.

If you have any questions regarding this letter or need further assistance, please contact the Missouri Ecological Services Field Office and reference Project Code 2023-0115323 associated with this Project.

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

Babler State Park

2. Description

The following description was provided for the project 'Babler State Park':

Missouri State Parks is upgrading 33 campsites located within the Dr. Edmund Babler State Park. Campsite upgrades include new concrete pads, electric, sanitary sewer, and water service. The site is located at 800 Guy Park Drive in Wildwood, MO.

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@38.609243750000005,-90.68693332884075,14z>



DETERMINATION KEY RESULT

Based on the answers provided, the proposed Action is consistent with a determination of “may affect, but not likely to adversely affect” for the Endangered northern long-eared bat (*Myotis septentrionalis*).

QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of the northern long-eared bat or any other listed species?

Note: Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

No

2. Do you have post-white nose syndrome occurrence data that indicates that northern long-eared bats (NLEB) are likely to be present in the action area?

Bat occurrence data may include identification of NLEBs in hibernacula, capture of NLEBs, tracking of NLEBs to roost trees, or confirmed acoustic detections. With this question, we are looking for data that, for some reason, may have not yet been made available to U.S. Fish and Wildlife Service.

No

3. Does any component of the action involve construction or operation of wind turbines?

Note: For federal actions, answer ‘yes’ if the construction or operation of wind power facilities is either (1) part of the federal action or (2) would not occur but for a federal agency action (federal permit, funding, etc.).

No

4. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

No

PROJECT QUESTIONNAIRE

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Ryan Schweissguth
Address: 530A E. Independence Drive
City: Union
State: MO
Zip: 63084
Email: rschweissguth@cochraneng.com
Phone: 6365840540

Appendix D: State Historic Preservation 106 Review Documents

Not Applicable for this project.

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[Things to Do](#)
[Make a Reservation](#)
[Find My Park](#)

ST. LOUIS COUNTY NATIONAL REGISTER LISTINGS

Affton High School , 8520 Mackenzie Road, Affton (8/12/10)

Alswel , 12696 Alswell Lane, Sunset Hills vicinity (1/03/89)

Archambault House , 603 Rue St. Denis, Florissant (5/13/76)

Assumption Greek Orthodox Church , 6900 Delmar Blvd., University City (9/23/80)

Atwood, John C. and Georgie, House (*Historic Resources of Ferguson, Missouri, MPDF*), 100 S. Clay Ave., Ferguson (5/20/18)

Aubuchon, August House (*Historic Resources of the City of St. Ferdinand MRA*), 1002 St. Louis, Florissant (9/12/79)

Aubuchon, Baptiste G., House , 450 Rue St. Jacques, Florissant (5/06/76)

B'Nai Amoona Synagogue , 524 Trinity, University City (4/22/84)

Ball-Essen Farmstead Historic District , 749 Babler Park Drive, Wildwood (12/28/01)

Bank of St. Ann , 10449 St. Charles Rock Road, St. Ann (10/9/2020)

Barretts Tunnels ([map](#)), 3015 Barrett Station Road, Kirkwood vicinity (12/08/78)

Bartean House (*Historic Resources of the City of St. Ferdinand MRA*), 305 N. Costello, Florissant (9/12/79)

Barton House (*Historic Resources of the City of St. Ferdinand MRA*), 680 Ste. Catherine, Florissant (9/12/79)

Bassett, Dr. Samuel A., Office and Residence , 1200 S Big Bend Blvd., Richmond Heights (2/3/93)

Bayley, Romanzo N., House (*Historic Resources of Kirkwood, Missouri MPDF*), 419 E. Argonne, Kirkwood (10/03/02)

Beaumont-Tyson Quarry District, address restricted, Crescent Hills vicinity (also in Jefferson County) (10/10/74)

Bellecourt Apartments , 1107-1123 Bellevue Ave., Richmond Heights (9/16/02)

Bennett Avenue Historic District , 7901-8027 Bennett Ave. and 1221-1282 Laclede Station Road, Richmond Heights (3/20/08)

Benoist, Louis Auguste, House (Oakland), 7802 Genesta St., Affton (6/23/69)

Beverly Theater , 7740 Olive Blvd., University City (8/04/05)

Big Chief Restaurant , 17352 Old Manchester Road, Wildwood (4/02/03)

Bissell, Gen. Daniel, House (Franklinville Farm), 10225 Bellefontaine Road, Bellefontaine Neighbors (11/28/78)

Blake, John P. and Dora, House (*Historic Resources of Kirkwood, Missouri MPDF*), 549 N. Taylor, Kirkwood (10/03/02).

Bockrath-Wiese House , St. Ferdinand Park, Florissant (2/02/79)

Bonhomme Creek Archaeological District, address restricted (11/21/74)

Bopp, William, House (*Historic Resources of Kirkwood, Missouri MPDF*), 12120 Old Big Bend Road, Kirkwood (4/05/06)

Bouas House (*Historic Resources of the City of St. Ferdinand MRA*), 1290 St. Joseph, Florissant (9/12/79)

Brentmoor Park ([map](#)), Brentmoor and Forest Ridge District, Brentmoor and Forest Ridge, Big Bend and Wydown Blvds., Clayton (9/23/82)

Burkhardt Historic District ([map](#)), 16662-16678 Chesterfield Airport Road, Chesterfield (08/31/00)

Burkhardt Historic District ([Boundary Increase](#) ; [map](#)), 16626-16660 (even numbered properties only) Chesterfield Airport Road, Chesterfield (5/05/06)

Busch's Grove , 9160 Clayton Road, Ladue (9/09/82; removed 1/07/05)

Cape, Dr. Leander W., Buildings ([map](#)), 7401-03 Hazel and 2737-47 Sutton, Maplewood (11/15/05)

Carney-Keightley House , 930 Hawkins Road, Fenton vicinity (7/08/10)

Carrswold Historic District ([map](#)), 1-26 Carrswold Drive, Clayton (9/09/82)

Casa Alvarez , 289 Rue St. Denis, Florissant (6/18/76)

Central Webster Historic District ([map](#)), roughly bounded by West and East Cedar, Plant and West Maple avenues, East and West Jackson Road, and Gray Avenue, Webster Groves (6/11/86)

Charbonier Bluff, address restricted, Hazelwood vicinity (9/28/95)

Church Street Commercial District ([map](#)), 2-100 Church St., Ferguson (8/23/84)

Clarke, Judge Enos, House (*Historic Resources of Kirkwood, Missouri MPDF*), 503 E. Monroe, Kirkwood (12/12/02)

- Claverach Park** , Roughly bounded by Broadview, Claverach, Crestwood, Harcourt, Hillvale and Ridgemoor drives, Clayton Road, and Wydown Bouelarvd, Clayton (8/24/15)
- Coldwater Cemetery** , 15290 Old Halls Ferry Road, Florissant vicinity (5/19/04)
- Comfort, James H. and Marietta, House** (*Historic Resources of Kirkwood, Missouri MPDF*), 235 E. Jefferson, Kirkwood (10/03/02)
- Coral Court Motel** , 7755 Watson Road, Marlborough (4/25/89; demolished)
- Cori House** , 1080 N. Berry Road, Glendale (10/02/86)
- Cragwold** , address restricted (12/30/09)
- Crescent Quarry Archaeological Site, address restricted, Crescent (2/12/71)
- Curtiss--Wright Aeroplane Factory** , 130 Banshee Road, Hazelwood (9/06/16)
- Czufin, Rudolph and Dorothy C., House** , 24 Dielman Road, Ladue (7/12/02)
- Delmar Loop-Parkview Gardens Historic District** ([map](#)), roughly bounded by Kingsland Ave., North Drive, Delmar Blvd., and Eastgate, University City (also St. Louis City) (2/16/84)
- Des Peres Presbyterian Church** (Old Stone Church), Geyer Road between Clayton and Manchester roads, Frontenac (4/14/78)
- Dr. Edmund A. Babler Memorial State Park Historic District (*ECW Architecture in Missouri State Parks, 1933-1942 TR*), Wildwood (2/27/85)
- Donaldson Court Apartments** , 601-15 Westgate Ave., University City (10/13/83)
- Douglas House** (*Historic Resources of the City of St. Ferdinand MRA*), 801 St. Francois, Florissant (9/12/79)
- Downtown Kirkwood Historic District** , 105-133 E. Argonne, 100-159 W. Argonne, 108-212 N. Clay, 105-140 E. Jefferson, 100-161 W. Jefferson, Kirkwood (10/28/09)
- East Monroe Historic District** (*Historic Resources of Kirkwood, Missouri MPDF* ; [map](#)), roughly bounded by Madison Ave., S. Holmes St., Scott Ave., and Smith St., Kirkwood (7/14/04)
- Fairfax House** , 9401 Manchester Road, Rock Hill (4/15/04)
- Farmers State Bank of Chesterfield** , 16676-78 Chesterfield Airport Road, Chesterfield (8/20/99)
- Father Dickson Cemetery** , 845 S. Sappington Road, Crestwood (10/6/2021)
- Ferguson, Charles W., House** (The Lockwood Group), 15-17 W Lockwood Ave., Webster Groves (9/18/84)
- Ferguson School-Central School** , 201 Wesley Ave., Ferguson (9/07/84)
- Fishback, George W. and Virginia, House** (*Historic Resources of Kirkwood, Missouri MPDF*), 440 E. Argonne, Kirkwood (10/03/02)
- Fort Bellefontaine, Address Restricted (2/23/16)

- Garrett, Louisa, House** (*Historic Resources of the City of St. Ferdinand MRA*), 280 Washington St., Florissant (6/27/07)
- Glen Echo Historic District** ([map](#)), 3401 Lucas-Hunt Road, 7202-48 Henderson Ave., 7200-71 St. Andrews Pl., Normandy and Glen Echo Park (10/25/07)
- Goldbeck House** (*Historic Resources of the City of St. Ferdinand MRA*), 1061 St. Louis, Florissant (9/12/79)
- Gorlock Building** , 101-113 W Lockwood Ave., Webster Groves (11/08/84)
- Grace Episcopal Church** (Eliot Unitarian Chapel), Taylor and Argonne, Kirkwood (4/12/82)
- Greenwood Cemetery** , 6571 St. Louis Ave., Hillsdale (2/24/04)
- Greenwood Historic District** ([map](#)), 3500-3540 Greenwood and 7518 St. Elmo, maplewood (4/12/06)
- Haarstick-Whittemore Houses** , 6420 and 6440 Forsyth Blvd., Clayton (9/20/82)
- Halsey, Egbert W., Cottage** (*Historic Resources of Kirkwood, Missouri MPDF*), 126 E. Washington, Kirkwood (10/03/02)
- Hammerman, Harry, House** , 219 Graybridge Ln., Ladue (3/20/08)
- Hampton Park** ([map](#)), 1108-1176 Center Drive, 1012-1259 Hampton Park Drive, 1140-1173 Hillside Drive, 7914-8045 Park Drive, 8000-8062 South Drive, 7510-7600 Clayton Road, Richmond Heights (12/21/05)
- Hanley, Martin Franklin, House** , 7600 Westmoreland Ave., Clayton (5/27/71)
- Hanson House** (*Historic Resources of the City of St. Ferdinand MRA*), 704 Ste. Catherine, Florissant (9/12/79)
- Hawken House** , 1155 S. Rock Hill Road, Webster Groves (2/16/70)
- Hawthorne, Nathaniel, Elementary School** , 1351 N. Hanley Road, University City (10/2/17)
- Henry Avenue Historic District** ([map](#)), 120, 210, 211, 218, 220, 226, 230, 310, 314 and 320 Henry Ave., Manchester (1/08/03)
- Hi-Pointe - De Mun Historic District** , roughly bounded by South Skinker Boulevard, Clayton Road, Seminary Place, De Mun Avenue and Northwood Avenue, Clayton (also in St. Louis City) (5/07/05)
- Hi-Pointe - De Mun Historic District (**Boundary Increase**), roughly bounded by Clayton Road, De Mun Avenue, San Bonita Avenue, and Big Bend Boulevard, Clayton (3/22/07)
- Hubecky House** (*Historic Resources of the City of St. Ferdinand MRA*), 197 Lafayette, Florissant (9/12/79)
- Hunt, Wilson Price, House** , 7717 Natural Bridge Road, Normandy (9/23/80)
- J. Milton Turner School** , 238 Meacham Ave. and 245 Saratoga Ave., Kirkwood (8/22/02)
- Jarville** (Renard-Queeny House), 1723 Mason Road, Manchester (2/16/84)
- Jefferson-Argonne Historic District** (*Historic Resources of Kirkwood, Missouri MPDF*), roughly defined as both sides of Jefferson Ave., the N side of Argonne bet. Taylor St. and Holmes Ave., Kirkwood (7/14/04)

Jefferson Barracks Historic District ([map](#)), roughly bounded by Mississippi River and Gark, Boundary and Sheridan roads, 10 miles south of St. Louis (2/01/72; AD, 10/08/10)

Jefferson Barracks Historic District ([Additional Documentation](#)) (10/8/10)

Jefferson Barracks National Cemetery (*Civil War Era National Cemeteries MPDF*), 2900 Sheridan Road, Green Park vicinity (10/02/98)

Jefferson Barracks VA Hospital (*United States Second Generation Veterans Hospitals MPDF*), 1 Jefferson Barracks Drive, St. Louis (7/14/15)

Keith, David, House (*Historic Resources of Kirkwood, Missouri MPDF*), 116 N. Woodlawn, Kirkwood (10/03/02)

Kirkwood Missouri Pacific Depot , W Argonne Drive at Kirkwood Road, Kirkwood (7/05/85)

Koch, Robert, Hospital , 4101 Koch Road, Oakville vicinity (10/31/84)

Kramer House (*Historic Resources of the City of St. Ferdinand MRA*), 520 Ste. Catherine, Florissant (9/12/79)

Kraus, Russell and Ruth Goetz, House , 120 N. Ballas Road, Kirkwood (01/31/97)

Kreienkamp Store , 19160 Melrose Road, Wildwood (05/05/00)

Kuehn House (*Historic Resources of the City of St. Ferdinand MRA*), 410 S. Harrison, Florissant (9/12/79)

Ladue Estates , 1-80 Ladue Estates Drive, Creve Coeur (5/26/10)

Lance House (*Historic Resources of the City of St. Ferdinand MRA*), 508 St. Antoine, Florissant (9/12/79)

Laramie, Marcus, House (*Historic Resources of the City of St. Ferdinand MRA*), 929 St. Denis, Florissant (9/12/79)

Larimore, Wilson, House , 11510 Larimore Road, Bellefontaine Neighbors (2/10/89)

Link, Theodore, Historic Buildings , 7100, 7104 and 7108 Delmar Blvd., University City (9/11/80)

Long, William, Log House , 9385 Pardee Road, Crestwood (12/05/78)

Lyceum, The , 920 Manchester Road, Manchester (4/03/79)

Manchester Methodist Episcopal Church , 129 Woods Mill, Manchester (2/10/83)

Maplewood Commercial Historic District at Manchester and Sutton , roughly bounded by Manchester, Marietta, Marshall and Sutton, Maplewood (12/20/06)

Maplewood Historic Commercial District ([map](#)), 7145-7233 and 7146-7192 Manchester Blvd. and 7209-11 Lanham, Maplewood (11/14/2019)

Marshall Place Historic District ([map](#)), Marshall Place and Elm Street vicinity, Webster Groves (6/17/82)

Maryland Terrace Historic District , 7001-7419 Maryland Ave., and 7001-7394 Westmoreland Drive, University City (9/03/98)

McGarry House , 6965 Pershing Ave., University City (4/12/82)

McLagan, Lizzie, House (*Historic Resources of Kirkwood, Missouri MPDF*), 549 E. Argonne, Kirkwood (10/03/02)

McMullen, Patrick and Moire, House (*Historic Resources of Kirkwood, Missouri MPDF*), 212 W. Monroe, Kirkwood (10/03/02)

McPherson-Holland House , 115 Edwin Ave., Glendale (9/16/82)

Meramec River U.S. Bridge - J421 (*Route 66 in Missouri MPDF*), historic U.S. Route 66 spanning the Meramec River, Eureka vicinity (9/16/09)

Meyer House (*Historic Resources of the City of St. Ferdinand MRA*), 915 N Lafayette, Florissant (9/12/79)

Moelling, Frank, House (*Historic Resources of the City of St. Ferdinand MRA*), 1002 Boone, Florissant (9/12/79)

Moller House (*Historic Resources of the City of St. Ferdinand MRA*), 200 Washington, Florissant (9/12/79)

Moorlands Addition Apartment District , roughly bounded by Clayton Road, Glenridge Avenue, Wydown Boulevard and (both sides) Westwood Drive, Clayton (9/30/09)

Mount Hope Cemetery , 1215 Lemay Ferry Road, Lemay (10/03/03)

Mudd's Grove , 302 W Argonne Drive, Kirkwood (4/05/84)

Murphy, Joseph and Ann, Residence , 7901 Stanford Ave., University City (5/10/10)

Myers, John B., House and Barn , 180 Dunn Road, Florissant (12/13/74; boundary increase, 9/19/77)

Narrow Gauge Railroad Station (*Historic Resources of the City of St. Ferdinand MRA*), 1060 Ste. Catherine, Florissant (9/12/79)

New Mount Sinai Cemetery , 8430 Gravois Road, Affton (12/22/05)

Nicolay House (*Historic Resources of the City of St. Ferdinand MRA*), 549 N St. Jacques, Florissant (9/12/79)

Nims Mansion , 2701 Finestown Road, Oakville (10/2/17)

Nipher, Prof. Frances E., House (*Historic Resources of Kirkwood, Missouri MPDF*), 435 N. Harrison, Kirkwood (10/03/02)

North Taylor Avenue Historic District (*Historic Resources of Kirkwood, Missouri MPDF*), roughly bounded by Manchester Road, East Adams and North Taylor avenues, Kirkwood (8/07/12)

Norwood Hills Country Club ([map](#)), 1 Norwood Hills Country Club Drive, Ferguson (2/25/05)

Old Ferguson West Historic District (*Historic Resources of Ferguson, Missouri, MPDF*), roughly bounded by Carson Road, Harvey and Tiffin avenues, and Florissant Road, Ferguson (11/02/11)

Old Stone Church (Old Bonhomme Church), Conway and White roads, Chesterfield vicinity (4/13/73)

Old Webster Historic District ([map](#)), roughly bounded by Allen Ave., Elm Ave., W. Lockwood Ave. and the Missouri Pacific RR Tracks, Webster Groves (8/04/04)

Old Webster Historic District ([Boundary Increase](#) ; [map](#)), 50-54 West Moody Ave., Webster Groves (11/13/2018)

Olive Chapel African Methodist Episcopal Church (*Historic Resources of Kirkwood, Missouri MPDF*), 309 S. Harrison Ave., Kirkwood (4/20/04)

Orrville Historic District ([map](#)), 526 and 538 Eatherton Road, Wildwood (10/18/03)

Osage Hills School , 1110 Glenwood S, Kirkwood (5/24/07)

Pappas, Theodore A., House , 865 Masonridge Road, Creve Coeur (2/14/79)

Parkview Historic District , roughly bounded by Delmar, Skinker, and Millbrook Blvds. and Mellville Ave., University City (also in St. Louis City) (3/14/86)

Pasadena Hills Historic District ([map](#)), bounded by the city limits of Pasadena Hills, Pasadena Hills (12/04/04)

Patterson, Elisha and Lucy, Farmstead Historic District , 15505 New Halls Ferry Road, Florissant vicinity (11/17/04)

Payne-Gentry House , 4211 Fee Fee Road, Bridgeton (4/17/79)

Peters House (*Historic Resources of the City of St. Ferdinand MRA*), 903 Rue St. Francois, Florissant (9/12/79)

Pine Lawn Carriage House , 6292-94 Stillwell Drive, Pine Lawn (2/16/84)

Plant, Samuel, House , 800 Cella Road, Ladue (4/19/84)

Pond School (*One-Teacher Public Schools of Missouri, c. 1774 to c. 1973 MPDF*), 17123 Manchester Road, Wildwood (11/06/12)

Price School , Price School Lane, Ladue (2/14/85)

Rannells, Charles S. and Mary Warder, House , 2200 Bredell, maplewood (9/20/06)

Red Cedar Inn , 1047 East Osage, Pacific (4/02/03)

Reeb House (*Historic Resources of the City of St. Ferdinand MRA*), 446 St. Charles, Florissant (9/12/79)

Richter, Theodore and Lena, House (*Historic Resources of Kirkwood, Missouri MPDF*), 229 S. Van Buren, Kirkwood (12/05/02)

Rickelman House (*Historic Resources of the City of St. Ferdinand MRA*), 680 Washington, Florissant (9/12/79)

Ripple, Otto, Agency (*Historic Resources of the City of St. Ferdinand MRA*), 753 Rue St. Francois, Florissant (9/12/79)

Robinson, George R. and Elsie, House (*Historic Resources of Kirkwood, Missouri MPDF*), 443 E. Argonne, Kirkwood (10/31/02)

Rock House (Edgewood Children's Center), 330 N. Gore, Webster Groves (9/09/82)

Rockwood Court Apartments , 330 W. Lockwood, Webster Groves (4/05/06)

Rott School , 9455 Rott Road, Sunset Hills (9/15/05)

St. Ferdinand Central Historic District (*Historic Resources of the City of St. Ferdinand MRA*), roughly bounded by Rue St. Francois, Rue St. Ferdinand, and Rue St. Denis, and Lafayette St., Florissant (9/12/79)

St. Ferdinand's Shrine Historic District (*Historic Resources of the City of St. Ferdinand MRA*), between Cold Water and Fountain Creeks, Florissant (9/12/79)

St. Stanislaus Seminary , 700 Howdershell Road, Florissant (9/22/72)

St. Vincent's Hospital , 7301 St. Charles Rock Road, Normandy (4/12/82)

Sancta Maria in Ripa ([map](#)), 320 E. Ripa Ave., Lemay (10/11/2022)

Sappington, Joseph, House , 10734 Clearwater Drive, Affton (10/14/82)

Sappington, Thomas J. House , 1015 S Sappington Road, Crestwood (6/28/74)

Sappington, Zephaniah, House , 11145 Gravois Road, Crestwood (9/18/80)

Saratoga Lanes Building , 2725 Sutton Blvd., Maplewood (1/29/08)

Schmidt House (*Historic Resources of the City of St. Ferdinand MRA*), 359 St. Jean, Florissant (9/12/79)

Schoonover House (*Historic Resources of the City of St. Ferdinand MRA*), 983 St. Antoine, Florissant (9/12/79)

Seed, Miles A., Carriage House , 2456 Hord Ave. (rear), Jennings (3/25/87)

Seven Gables Building , 18-26 N Meramec, Clayton (7/16/85)

Shanley Building , 7800 Maryland Ave., Clayton (9/20/82)

Sioux Passage Park Archaeological Site, address restricted, Florissant (7/24/74)

Smith House (*Historic Resources of the City of St. Ferdinand MRA*), 310 Florissant Road, Florissant (9/12/79)

Stroer House (*Historic Resources of the City of St. Ferdinand MRA*), 700 Aubuchon, Florissant (9/12/79)

Sutter-Meyer House , 6826 Chamberlain Court, University City (4/12/82)

Taille de Noyer (Mullanphy-Chambers House), 1 Rue Taille de Noyer, Florissant (1/10/80)

- Tebeau House** (*Historic Resources of the City of St. Ferdinand MRA*), 250 Ste. Catherine, Florissant (9/12/79)
- Tebeau, Marvin, House** (*Historic Resources of the City of St. Ferdinand MRA*), 449 St. Joseph, Florissant (9/12/79)
- Thornhill** (Governor Bates Estate), Faust County Park, Olive St. Road, Chesterfield (7/18/74)
- Tilles, Rosalie, Park** , 9551 Litzinger Road, Ladue (4/19/18)
- Tolhurst, G. W., House** (*Historic Resources of Kirkwood, Missouri MPDF*), 345 E. Argonne, Kirkwood (10/03/02)
- Tuxedo Park Christian Church** , 700 Tuxedo Blvd., Webster Groves (11/08/06)
- Tuxedo Park Station** , 643 Glen Road at Tuxedo Blvd., Webster Groves (3/22/84)
- U.S. Army Publications Distribution Center, 1655 Woodson Road, Overland (10/5/15)
- University City Education District** (Jackson Park Elementary, Hanley Junior High and University City Senior High School), 7400 and 7401 Balson Ave., and 951 N. Hanley Road, University City (1/31/85)
- University City Plaza** , bounded roughly by Delmar Boulevard; Trinity, Harvard, and Kingsland avenues; and south residential property line, University City (3/07/75)
- University Heights Subdivision Number One** ([map](#)), roughly bounded by Delmar Boulevard, Yale, Dartmouth and Harvard Ave., University City (9/23/80)
- Unsell, Elijah J., House** (*Historic Resources of Kirkwood, Missouri MPDF*), 615 E. Monroe, Kirkwood (12/12/02)
- Washington University Hilltop Campus Historic District** , roughly bounded by Big Bend, Forsyth, Skinker, and Millbrook Blvds., Clayton (1/12/79; NHL 3/09/87)
- Way, James W. and Mary, House** (*Historic Resources of Kirkwood, Missouri MPDF*), 305 N. Harrison, Kirkwood (12/12/02)
- Webster College-Eden Theological Seminary Collegiate District** , 470 and 475 E Lockwood Ave., Webster Groves (12/28/82)
- Webster Park Residential Historic District** , roughly bounded by Newport, Bompert, East Lockwood, North Maple and Glen Road, Webster Groves (12/30/08)
- White Haven** (Grant-Dent House), 9060 Whitehaven, Grantwood Village (4/04/79; NHL 6/23/86)
- Wildwood House** , 40 Dames Court, Ferguson (4/05/06)
- Williams Creek Archaeological District, address restricted (11/23/77)
- Withington House** (*Historic Resources of the City of St. Ferdinand MRA*), 502 St. Marie, Florissant (9/12/79)
- Wydown-Forsyth District** ([map](#)), roughly bounded by Forsyth, Skinker Blvd., Fauquier and Wydown Terrace Drive, and University Lane, Clayton (also in St. Louis City) (5/23/88)

*Each bold-faced link in the list above leads to a word-searchable NATIONAL REGISTER NOMINATION for that resource; other links provide maps or additional context for the resource. The items may be downloaded (right-click) or viewed in your Web browser (double-click). File sizes range from 1 MB to several hundred MB, the time required for loading will depend on your connection speed. You may obtain a free copy of Adobe Reader software required to read the materials by visiting our [Help page](#).

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Appendix E: Self-Inspection Form

BMP Self-Inspection: Land Disturbance Permit

Date:	Time:	Project Name:
		Permit #: MOR-100038
Designated Responsible Person In SWPPP: (Name, Company)		
<input type="checkbox"/> Weekly <input type="checkbox"/> Biweekly <input type="checkbox"/> Post Rain Event Rainfall Total: <input type="checkbox"/> Other:		

Inspection Checklist	Satisfactory?	Corrective Action Needed and Notes
SWPPP -Is SWPPP on site and updated with records attached? Is sign posted on construction site? Is ESC Plan updated?	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NA	Date Completed:
Construction Exit -Is sediment trackout controlled at the construction exit? Are streets substantially free of sediment?	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NA	Date Completed:
Stockpiles -Are stockpiles stabilized or controlled by a BMP? Are borrow/fill areas identified on the SWPPP?	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NA	Date Completed:
Dewatering operations -Are dewatering operations filtering sediment/pollutants?	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NA	Date Completed:
Housekeeping -Are litter, construction debris, and construction chemicals controlled?	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NA	Date Completed:
BMP Maintenance -Have all BMPs been repaired/ sediment accumulation removed? Should any BMPs be added and/or removed?	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NA	Date Completed:
Tree Protection -Is fencing installed properly? Are root zones and tree canopy protected from equipment, vehicles and construction material?	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NA	Date Completed:
Stabilization -Has temporary or final stabilization been achieved on areas inactive for more than 14 days?	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NA	Date Completed:
Stormwater Outfall and Receiving Streams -Is the outfall free from sediment accumulation? Are receiving waters free of visible pollutants?	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NA	Date Completed:

Additional Comments –		
------------------------------	--	--

<p>SWPPP Amendment Log – Create a log here of changes and updates to the SWPPP. Modifications are required when: Design, operation, or maintenance of BMPs is changed; Design of the construction project is changed that could significantly affect the quality of the stormwater discharges; Permittee’s inspections indicate deficiencies in the SWPPP; SWPPP is determined to be ineffective in minimizing or controlling erosion and sedimentation (e.g., there is visual evidence of excessive site erosion or excessive sediment deposits in streams or lakes); and settleable solids from a stormwater outfall exceeds visual assessment by inspector.</p>	<input type="checkbox"/> New amendment detail added to SWPPP	<p>Date:</p> <p>Explanation of amendment found on ESC plan:</p>
---	--	---

<p>Grading and Stabilization Log – Create a log here of grading and stabilization. The Construction General Permit requires that interim stabilization must be initiated immediately and completed within 7 calendar days where soil disturbing activities have temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. Interim stabilization shall consist of well established and maintained BMPs. Final stabilization of disturbed areas must be initiated immediately and completed within 7 calendar days whenever any clearing, grading, excavating or other earth disturbing activities have permanently ceased on any portion of the site.</p> <p>Stabilization refers to actions taken to secure soil in its location and to prevent it from moving via stormwater runoff or trackout.</p>	<input type="checkbox"/> Construction temporarily ceased <input type="checkbox"/> Temporary BMPs are in place <input type="checkbox"/> Construction permanently ceased <input type="checkbox"/> Stabilization has begun <input type="checkbox"/> Stabilization is complete	<p>Date:</p> <p>Location:</p> <p>Temporary BMPs:</p> <p>Permanently Stabilized by:</p> <input type="checkbox"/> Mulch <input type="checkbox"/> Rock <input type="checkbox"/> Concrete/Asphalt <input type="checkbox"/> Hydroseed <input type="checkbox"/> Sod <input type="checkbox"/> Seed and Straw <input type="checkbox"/> Other:
--	--	---

Unless otherwise noted, all corrective actions must be completed by:

Training: The person designated as responsible for environmental matters, and the person designated to conduct self-inspections (if different) are required to have thorough and demonstrable knowledge of erosion and sediment control practices. Training is recommended. Please call 864-1944 for local training opportunities.

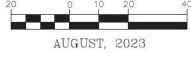
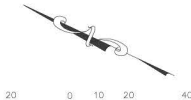
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage 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.

Name: _____ **Signature:** _____

Appendix F: Site Maps, Plans and Details Sheet

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LEGEND	
EXISTING	PROPOSED
— —	PROPERTY LINE
— —	RIGHT-OF-WAY
— —	UNDERSIING ELECTRIC
— —	SANITARY SEWER
— —	SANITARY MANHOLE
— —	STORM SEWER
— —	FLARED END SECTION
— —	WATER LINE (SIZE)
— —	FIRE HYDRANTS
— —	WATER VALVE
— —	WATER METER
— —	TREE
— —	LIGHT
— —	CONCRETE PAVEMENT
— —	ASPHALT PAVEMENT
— —	GRAVEL SURFACE



AUGUST, 2023



STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES
MANAGEMENT,
DESIGN AND CONSTRUCTION

DEPARTMENT OF
MISSOURI STATE PARKS
NATURAL RESOURCES

CAMPSITE
RENOVATION
& UPDATE

DR. EDMUND
BABLER STATE PARK
WILDWOOD, MISSOURI

PROJECT # X2312-01
SITE # 5201
FACILITY # 7815201095

REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
ISSUE DATE: XX/XX/XXXX

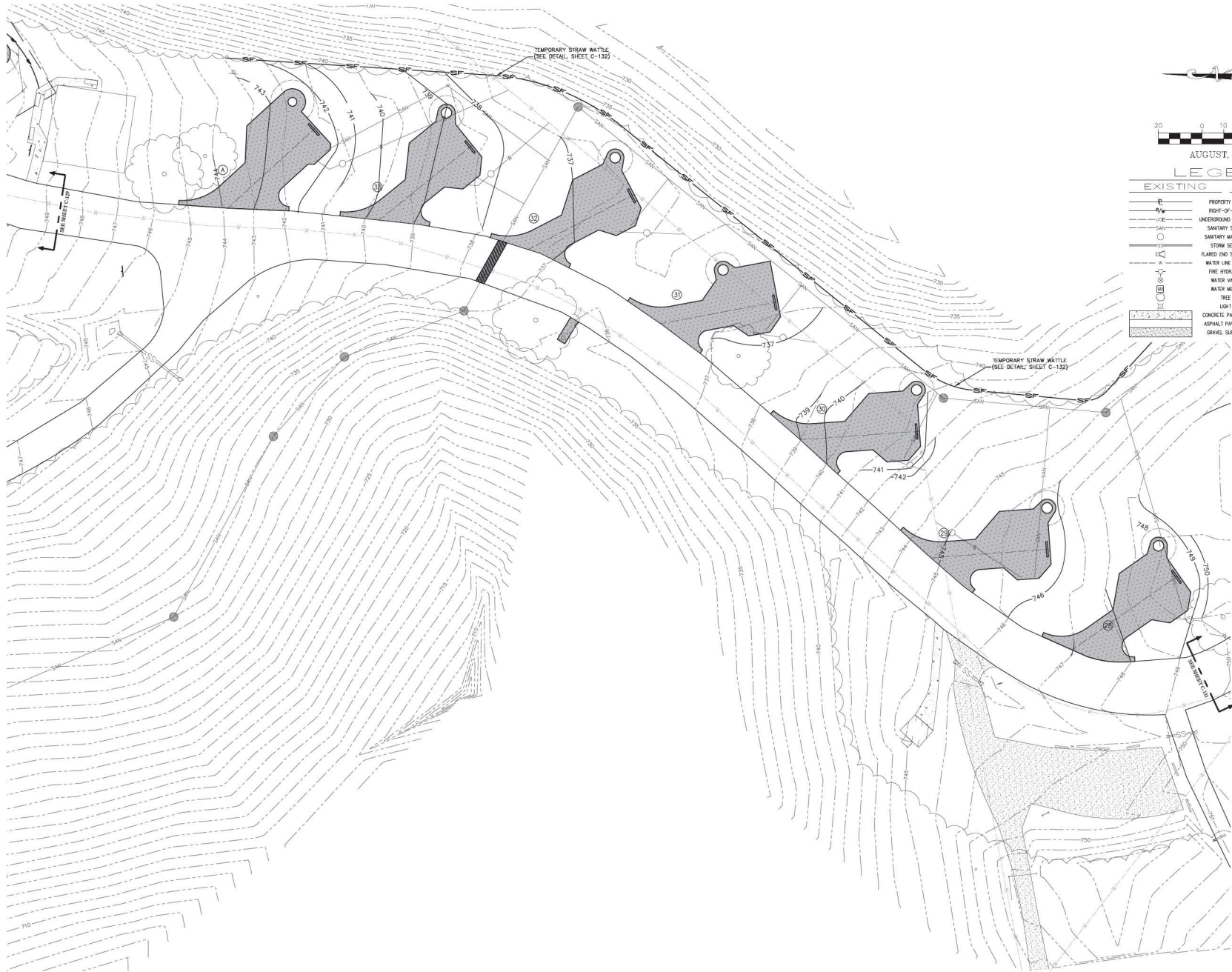
CAD DWG FILE: X2312-ES-129
DRAWN BY: JLR
CHECKED BY: XXX
DESIGNED BY: XXX

SHEET TITLE:
EROSION & SEDIMENT
CONTROL PLAN

SHEET NUMBER:

C-129

30 OF 42 SHEETS
08/10/2023



AUGUST, 2023

LEGEND

EXISTING	PROPOSED
—	PROPERTY LINE
—	RIGHT-OF-WAY
—	UNDERGROUND ELECTRIC
—	SANITARY SEWER
—	SANITARY MANHOLE
—	STONE SEWER
—	FLARED END SECTIONS
—	WATER LINE (302)
—	FIRE HYDRANTS
—	WATER VALVE
—	WATER METER
—	TREE
—	LIGHT
—	CONCRETE PAVEMENT
—	ASPHALT PAVEMENT
—	GRAVEL SURFACE

STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES
MANAGEMENT,
DESIGN AND CONSTRUCTION

DEPARTMENT OF
MISSOURI STATE PARKS
NATURAL RESOURCES

CAMPSITE
RENOVATION
& UPDATE

DR. EDMUND
BABLER STATE PARK
WILDWOOD, MISSOURI

PROJECT # X2312-01
SITE # 5201
FACILITY # 7815201095

REVISION:	_____
DATE:	_____
REVISION:	_____
DATE:	_____
REVISION:	_____
DATE:	_____
ISSUE DATE:	XX/XX/XXXX

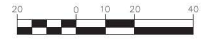
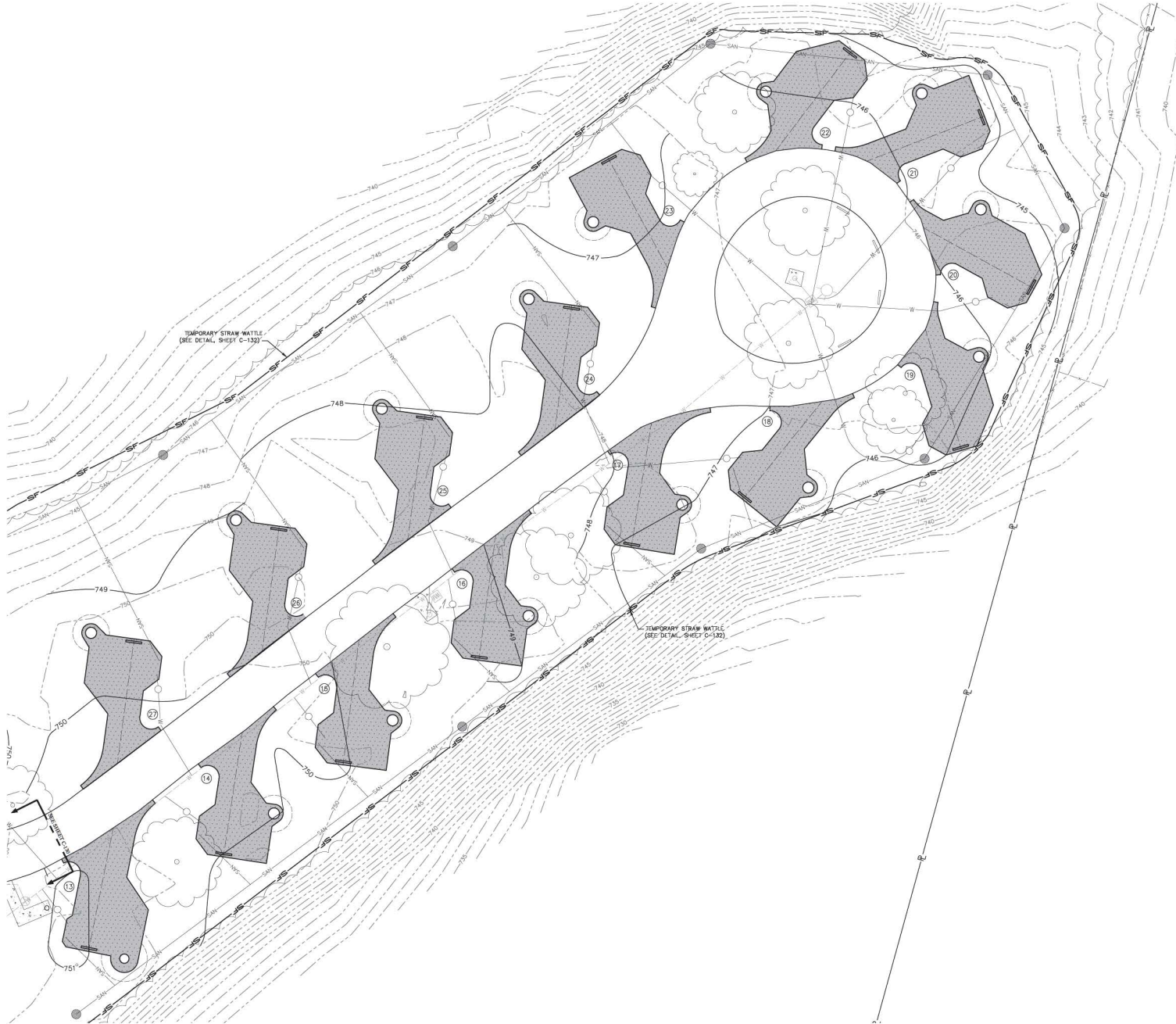
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DRAWN BY: JLR
CHECKED BY: KKS
DESIGNED BY: EBR

SHEET TITLE:
EROSION & SEDIMENT
CONTROL PLAN

SHEET NUMBER:

C-130

31 OF 42 SHEETS
08/10/2023



AUGUST, 2023

LEGEND	
EXISTING	PROPOSED
—	PROPERTY LINE
—	RIGHT-OF-WAY
—	UNDERGROUND ELECTRIC
—	SANITARY SEWER
—	SANITARY MANHOLE
—	STORM SEWER
—	FLARED END SECTIONS
—	WATER LINE (SIZE)
—	FIRE HYDRANTS
—	WATER VALVE
—	WATER METER
—	TREE
—	LIGHT
—	CONCRETE PAVEMENT
—	ASPHALT PAVEMENT
—	GRAVEL SURFACE

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES
MANAGEMENT,
DESIGN AND CONSTRUCTION

DEPARTMENT OF
MISSOURI STATE PARKS
NATURAL RESOURCES

CAMPSITE
RENOVATION
& UPDATE

DR. EDMUND
BABLER STATE PARK
WILDWOOD, MISSOURI

PROJECT # X2312-01
SITE # 5201
FACILITY # 7815201095

REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
ISSUE DATE: XX/XX/XXXX

CAD DWG FILE: X2312-ES-131
DRAWN BY: JLR
CHECKED BY: KRS
DESIGNED BY: EBR

SHEET TITLE:
EROSION & SEDIMENT
CONTROL PLAN

SHEET NUMBER:

C-131

32 OF 42 SHEETS
08/10/2023

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Appendix G: Site Sign

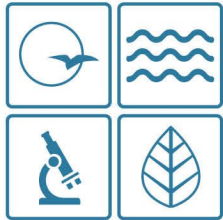
**LAND DISTURBANCE PERMIT
STORMWATER POLLUTION PREVENTION PLAN
PERMITTED BY:**

MISSOURI STATE OPERATING PERMIT NUMBER:

MOR-100038

Contact Name	
Contact Cell Phone	
Project Name	
SWPPP Location	
Spill Kit Location	

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MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Michael L. Parson
Governor

Dru Buntin
Director

August 1, 2022

Leanne Mattern
Office of Administration, Facilities Management Design & Construction
Harry S. Truman SOB,
301 West High Street, Room 730
Jefferson City, MO 65102

Dear Permittee:

Pursuant to the Federal Water Pollution Control Act, under the authority granted to the State of Missouri and in compliance with the Missouri Clean Water Law, we have issued and are enclosing your Missouri State Operating Permit for Office of Administration, MOR-100038.

Please read and review your permit and attached Standard Conditions. They contain important information on site management and reporting requirements. Quarterly reports required by this report must be submitted through our eDMR system.

This permit may include requirements with which you may not be familiar. If you would like The Department of Natural Resources to meet with you to discuss how to satisfy the permit requirements, an appointment can be set up by contacting the permit writer at 573-526-1139. These visits are called Compliance Assistance Visits and focus on explaining the requirements to the permit holder.

This permit is both your Federal NPDES Permit and your new Missouri State Operating Permit and replaces all previous State Operating Permits issued for this facility under this permit number. In all future correspondence regarding this facility, please refer to your State Operating Permit number and facility name as shown on page one of the permit.

If you were adversely affected by this decision, you may be entitled to an appeal before the Administrative Hearing Commission (AHC) pursuant to 10 CSR 20-1.020 and 10 CSR 20-6.020; RSMo Section 621.250, 640.013, and 644.051.6. 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. Contact information for the AHC is: Administrative Hearing Commission, Truman State Office Building, Room 640, 301 W. High Street, P.O. Box 1557, Jefferson City, Missouri 65102, phone: (573) 751-2422, fax: (573) 751-5018; website: <http://ahc.mo.gov/>.

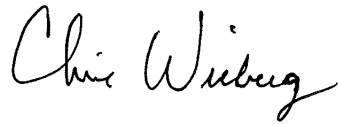


Office of Administration
Page Two

Please be aware that this facility may also be subject to any applicable county or other local ordinances or restrictions. If you have any questions concerning this permit, please do not hesitate to contact the Water Protection Program at P.O. Box 176, Jefferson City, MO 65102, 573-522-4502.

Sincerely,

WATER PROTECTION PROGRAM

A handwritten signature in black ink that reads "Chris Wieberg". The signature is written in a cursive style with a large initial "C" and a long, sweeping underline.

Chris Wieberg
Director

CW/qs

Enclosure

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 MOR100038

Owner: OA-Facilities Mgmt, Design, and Construc
Address: 301 West High Street, Hst Rm 370
Jefferson City, MO 65101

Continuing Authority: OA Facilities Mgmt Design Construction
301 West High St.
HST SOB Rm 730
Jefferson City, MO 65102

Facility Name: Office of Administration
Facility Address: OA-FMDC, PO Box 809 301 W High street
JEFFERSON CITY, MO 65102

Legal Description: Land Grant 02681, Cole County
UTM Coordinates: 571840.000/4270368.000
Receiving Stream: Tributary to Wears Creek (U)
First Classified Stream - ID#: 100K Extent-Remaining Streams (C) 3960.00
USGS# and Sub Watershed#: 10300102 - 1304

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.

August 01, 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(1)(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, 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; 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.

Table A	Schedule for Quarterly Reporting
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:

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 1st 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_able.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, 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. For more information visit; 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

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

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