PROJECT MANUAL

Vehicular Bridge & Pedestrian Trail Network

Bennett Spring State Park

Lebanon, Missouri

Designed By: Bartlett and West, Inc.
601 Monroe St., Suite 201
Jefferson City, MO 65101

Date Issued: April 10, 2025

Project No.: X2328-01

STATE *of* MISSOURI

OFFICE *of* ADMINISTRATION

Facilities Management, Design and Construction

SECTION 00 0107 - PROFESSIONAL SEALS AND CERTIFICATIONS

PROJECT NUMBER: X2328-01 – VEHICULAR BRIDGE & PEDESTRIAN TRAIL
BENNETT SPRING STATE PARK

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:

NEIL S. BRADY

LICENSE NO.: PE-2000162078

BARTLETT & WEST, INC

MISSOURI CERTIFICATE OF AUTHORITY NO. 000167 – ENGINEERING

601 MONROE ST, SUITE 201

JEFFERSON CITY, MO 65101-3180

DATE PREPARED: MARCH 13, 2025

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SECTION 00 0115 – LIST OF DRAWINGS

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:

PAGE NUMBER	TITLE	SHEET #	DATE	CAD #
1	Cover Sheet	Sheet G-001	04/10/25	G-001
2	General Notes	Sheet G-002	04/10/25	G-002
3	Typical Sections	Sheet G-003	04/10/25	G-003
4	Control Points	Sheet C-001	04/10/25	C-001
5	Sheet Overview	Sheet C-100	04/10/25	C-100
6-7	Plan & Profile Alignment Tables	Sheet C-101-102	04/10/25	C-101
8-9	Plan & Profile BSSP 1 Rd	Sheet C-103-104	04/10/25	C-101
10-16	Plan & Profile Trail	Sheet C-105-111	04/10/25	C-101
17	Plan & Profile Whistle Trail	Sheet C-112	04/10/25	C-101
18	Plan & Profile Intersections & Driveways	Sheet C-113	04/10/25	C-101
19	Storm Profiles	Sheet C-114	04/10/25	C-114
20-22	Cross Section BSSP 1 Rd	Sheet C-301-303	04/10/25	C-301
23-32	Cross Section Trail	Sheet C-304-313	04/10/25	C-301
33-35	Details	Sheet C-501-503	04/10/25	C-500
36	Erosion Control Plan	Sheet C-800	04/10/25	C-800
37	Erosion Control Plan & Details	Sheet C-801	04/10/25	C-801

38	Pavement Marking & Signage Plan	Sheet C-810	04/10/25	C-810
39	Pavement Marking & Signage Details	Sheet C-811	04/10/25	C-811
40-41	Traffic Control Plan & Const. Phasing	Sheet C-820	04/10/25	C-820
42	Traffic Control Plan	Sheet C-821	04/10/25	C-821
42	Bridge Elevation and Plan	Sheet S-001	04/10/25	S-001
43	General Notes & Estimated Quantities	Sheet S-002	04/10/25	S-002
44-46	Details of End Bent No. 1 & End Bent No. 3	Sheet S-003-005	04/10/25	S-003
47	Vertical Drain and End Bents	Sheet S-006	04/10/25	S-006
48-49	Details of Int. Bent No. 2	Sheet S-007-008	04/10/25	S-007
50	Spread Box Beams	Sheet S-009	04/10/25	S-009
51	Details of Conc. Diaphragm at Int. Bent	Sheet S-010	04/10/25	S-010
52	Camber Slab Haunching and Slab Elev. Diagrams	Sheet S-011	04/10/25	S-011
53-54	Slab Details	Sheet S-012-013	04/10/25	S-012
55	Type D Barrier	Sheet S-014	04/10/25	S-014
56	Type D Barrier at End Bents	Sheet S-015	04/10/25	S-015
57	Conduit Details	Sheet S-016	04/10/25	S-016
58-59	Barbill	Sheet S-017-018	04/10/25	S-017
60	As-Built Pile Data	Sheet S-019	04/10/25	S-019
61-62	Boring Data	Sheet S-020-021	04/10/25	S-020

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. Vehicular Bridge & Pedestrian Trail Network
Bennett Spring State Park
Lebanon, Missouri
Project No.: X2328-01

3.0 BIDS WILL BE RECEIVED:

A. Until: 1:30 PM, June 24, 2025

B. **Only electronic bids sent to FMDCBids@oa.mo.gov shall be accepted: (See Instructions to Bidders for further detail)**

4.0 DESCRIPTION:

A. Scope: The project includes a vehicular bridge over Bennett Spring Branch and a paved trail for pedestrian and bicycle use.

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.**

5.0 PRE-BID MEETING:

A. Place/Time: 10:00 AM, May 27, 2025, at Bennett Spring State Park Nature Center, 26250 MO-64A, Lebanon, MO.

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: Bartlett and West, Inc., Neil Brady, (417)830-0242, email: neil.brady@bartwest.com

B. Project Manager: Nathan Graessle, (573)508-6646, email: nathaniel.graessle@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.

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 one (1) party may be limited in accordance with available supply.

B. For the convenience of contractors, subcontractors and suppliers, bidding documents are available on the Owner's website at 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 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 successful Bidder (contractor) to fulfill every detail of the requirements of the contract, nor accepted as a basis for any claims for extra compensation or time extension.

B. Under no circumstances will Bidders give their plans and specifications to other Bidders. It is highly encouraged, but not required, that all Bidders be on the official planholders list to receive project updates including but not limited to any addenda that are issued during the bidding process.

4.0 - INTERPRETATIONS

A. No Bidder shall be entitled to rely on oral or written representations from any person as to the meaning of the plans and specifications or the acceptability of alternate products, materials, form or type of construction.

B. Bidders shall make all requests for interpretations in writing and submit all requests to the Project Designer and Project Manager identified in Section 007300 – Supplementary Conditions with all necessary supporting documentation no less than five (5) working days before opening of bids. Responses to requests for interpretation will be issued via a written addendum and will be sent as promptly as is practicable to all official planholders and posted on the Owner's website. All such addenda shall become part of the bid and contract documents.

C. Bidders shall make all requests for an "Acceptable Substitution" on the Section 006325 Substitution Request Form. The request shall be emailed to the Project Designer and Project Manager identified in Section 007300 – Supplementary Conditions no less than five (5) working days before opening of bids. Responses to requests for substitutions will be issued via a written addendum and will be sent as promptly as is practicable to all official planholders and posted on the Owner's website. All such addenda shall become part of the bid and contract documents.

D. An "Acceptable Substitution" requested after the award of bid will only be approved if proven to the satisfaction of the Owner and the Designer 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 and all requests of this nature must be submitted in accordance with Article 3.1 of the General Conditions.

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 on the bid documents or the bid will be rejected for being non-responsive.

B. Depending on the specific project requirements, **the following is a GENERIC list** of all possible bid forms that may be due with bid submittals. Bidders must verify each specific project's requirements in Section 004113 to ensure they have provided all the required documentation with their submission.

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

C. The Bidder shall submit its bid on the forms provided by the Owner in the same file format (PDF) with each space fully and properly completed, typewritten or legibly printed, including all amounts required for alternate bids, unit prices, cost accounting data, etc. The Owner will reject bids that are not on the Owner's forms or that do not contain all requested information. All forms can be found on the Owner's website at https://oa.mo.gov/facilities/bid-opportunities/bid-listing-electronic-plans and shall be submitted with your bid to FMDCBids@oa.mo.gov.

D. All bids shall be submitted without additional terms and conditions, modifications, or reservations. The completed forms should not include interlineations, alterations, or erasures. Bids not in compliance with the requirements of this paragraph will be rejected as non-responsive.

E. 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 in the bid documents in Section 004113. Failure of the Bidder to submit the duly authorized bid bond or 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 bid closing or if the Bidder, within ten (10) working days after notification of award, refuses or is unable to 1) execute the tendered contract, 2) provide an acceptable performance and payment bond, or 3) provide evidence of required insurance coverage.

F. The bid bond 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.

6.0 - SIGNING OF BIDS

A. 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. If the Bidder is an entity organized in a state other than Missouri, the Bidder must provide a Certificate of Authority to do business in the State of Missouri.

B. If the successful Bidder is doing business in the State of Missouri under a fictitious name, the Bidder 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.

C. A bid from an individual shall be signed as noted on the Bid Form.

D. 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.

E. A bid from a limited liability company (LLC) shall be signed by a manager or a managing member of the LLC.

F. A bid from a corporation shall have the correct corporate name thereon and the signature of an authorized officer of the corporation. Title of office held by the person signing for the corporation shall appear, along with typed name of said individual and the corporate license number shall be provided. In addition, for corporate proposals, the President or Vice-President listed per the current filing with the Missouri Secretary of State should sign as the Bidder. If the signatory is other than the corporate president or vice president, the bidder must provide satisfactory evidence that the signatory has the legal authority to bind the corporation.

7.0 - RECEIVING BID SUBMITTALS

A. It is the Bidder's sole responsibility to ensure receipt of the bid submittals by Owner on or before the date and time specified in the Invitation for Bid or as modified via written addenda. Bids received after the date and time specified will not be considered by the Owner.

B. All bids shall be received via email at FMDCBids@oa.mo.gov and bids received by the Owner through any other means, including hard copies, will not be considered, and will be discarded by the Owner unopened.

8.0 - MODIFICATION AND WITHDRAWAL OF BIDS

A. Bidder may withdraw a bid at any time prior to the 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. Bidder may modify a bid until the scheduled closing time by sending a revised bid to FMDCBids@oa.mo.gov with a note in the subject line and body of the email that it is a revised bid. All revised bids must be submitted to FMDCBids@oa.mo.gov, revised bids sent any other way will not be considered.

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 limited to, contracts for the furnishing and installation of furniture, equipment, machinery, appliances and other apparatuses.

C. The Owner will award a contract to the lowest, responsive, and 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 award shall be considered binding upon the Owner until the written contract has been properly executed and the following documentation has been provided: 1) performance and payment bond consistent with Article 6.1 of the General Conditions; 2) proof of the required insurance coverage; 3) an executed Section 004541 - Affidavit of Work Authorization form; and 4) documentation evidence enrollment and participation in a federal work authorization program.

F. Failure to execute and return the contract and associated documents within the prescribed period 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.

G. 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.

H. 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. Bidders must also submit an E-Verify Memorandum before the Owner may award a contract to the Bidder. Information regarding a 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.

I. The successful Bidder must be registered in MissouriBUYS powered by MOVERS at https://missouribuys.mo.gov/supplier-registration# as an approved vendor prior to being issued a contract.

10.0 - CONTRACT SECURITY

A. The successful Bidder shall furnish a performance/payment bond as set forth in General Conditions Article 6.1 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, manufacturer, or suppliers 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. 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 or if more than one subcontractor is listed for any category without designating the portion of work to be performed by each, 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 Bidder'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. 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 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 required to complete and submit the applicable portion of Section 004545 - Anti-Discrimination Against Israel Act Certification with its 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.

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 nonresponsive, and its bid shall be rejected.

2. The Bidder should submit with its bid all 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 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 Prime Bidder that qualifies as an SDVE shall receive a three-percentage 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 will become 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.

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.) 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 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 Equal Opportunity or by the Federal U.S. Small Business Administration directory.

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 Office of Equal Opportunity online SDVE directory at https://oeo.mo.gov/sdve-certification-program/ or the Federal U.S. Small Business Administration directory https://veterans.certify.sba.gov/#search.

3. Additional information, clarifications, or other information regarding the MBE/WBE/SDVE listings in the directories may be obtained by contacting 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 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 granted a waiver and will be considered 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;

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 in the 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 nonresponsive 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 the 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 in writing.

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
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: **Vehicular Bridge & Pedestrian Trail Network**
Bennett Spring State Park
Lebanon, Missouri

Project Number: **X2328-01**

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 **205 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: $

Accepted Alternates, if applicable to the Project and accepted by the Owner.

TOTAL CONTRACT AMOUNT: ($CONTRACT AMOUNT)

UNIT PRICES: The Owner accepts the following Unit Prices:

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), if applicable
    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), if applicable
    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.

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

Bond No._____

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

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

FINAL RECEIPT OF PAYMENT AND RELEASE

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

ORIGINAL: FILE/Closeout Documents

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

PAY APP NO.	PROJECT NUMBER
CHECK IF FINAL ☐**FINAL**	DATE

MBE/WBE/SDVE PROGRESS REPORT

Remit with **ALL** Progress and Final Payments

(Please check appropriate box) ☐CONSULTANT ☐CONSTRUCTION

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
☐ MBE ☐ WBE ☐ SDVE	$	$	
☐ MBE ☐ WBE ☐ SDVE	$	$	
☐ MBE ☐ WBE ☐ SDVE	$	$	
☐ MBE ☐ WBE ☐ SDVE	$	$	
☐ MBE ☐ WBE ☐ SDVE	$	$	
☐ MBE ☐ WBE ☐ SDVE	$	$	

Revised 06/2023

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

FILE: Closeout Documents

GENERAL CONDITIONS

INDEX

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, tools, 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 so that the project shall be complete and finished 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 ensure 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 under this clause to any labor union with which they have bargaining or other agreements.

B. 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 ensure 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 two percent (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 <u>without</u> 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.

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 contact 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:
Neil Brady
Bartlett and West, Inc.
601 Monroe St., Suite 201
Jefferson City, Missouri 65101
Telephone: (417) 830-0242
Email: neil.brady@bartwest.com

Construction Representative:
John Gentges Jr.
Division of Facilities Management, Design and Construction
301 W. High Street, Room 730
Jefferson City, Missouri 65109
Telephone: (573) 291-9596
Email: john.gentges@oa.mo.gov

Project Manager:
Nathan Graessle
Division of Facilities Management, Design and Construction
301 West High Street, Room 730
Jefferson City, Missouri 65101
Telephone: (573) 508-6646
Email: nathaniel.graessle@oa.mo.gov

Contract Specialist:
Paul Girouard
Division of Facilities Management, Design and Construction
301 West High Street, Room 730
Jefferson City, Missouri 65101
Telephone: (573) 751-4797
Email: paul.girouard@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 5 complete sets of drawings and specifications at no charge.

B. The Owner will furnish the Contractor with approximately 5 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.

Missouri
Division of Labor Standards
WAGE AND HOUR SECTION

MICHAEL L. PARSON, Governor

Annual Wage Order No. 31

Section 030
DALLAS 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 8, 2024**

Last Date Objections May Be Filed: **April 8, 2024**

Prepared by Missouri Department of Labor and Industrial Relations

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Asbestos Worker	$19.31*
Boilermaker	$19.31*
Bricklayer-Stone Mason	$19.31*
Carpenter	$19.31*
Lather	
Linoleum Layer	
Millwright	
Pile Driver	
Cement Mason	$19.31*
Plasterer	
Communication Technician	$19.31*
Electrician (Inside Wireman)	$51.14
Electrician Outside Lineman	$19.31*
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Elevator Constructor	$19.31*
Glazier	$19.31*
Ironworker	$19.31*
Laborer	$19.31*
General Laborer	
First Semi-Skilled	
Second Semi-Skilled	
Mason	$19.31*
Marble Mason	
Marble Finisher	
Terrazzo Worker	
Terrazzo Finisher	
Tile Setter	
Tile Finisher	
Operating Engineer	$19.31*
Group I	
Group II	
Group III	
Group III-A	
Group IV	
Group V	
Painter	$19.31*
Plumber	$19.31*
Pipe Fitter	
Roofer	$19.31*
Sheet Metal Worker	$19.31*
Sprinkler Fitter	$19.31*
Truck Driver	$19.31*
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
DALLAS County

Section 030

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Carpenter	$19.31*
Millwright	
Pile Driver	
Electrician (Outside Lineman)	$19.31*
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Laborer	$44.33
General Laborer	
Skilled Laborer	
Operating Engineer	$52.03
Group I	
Group II	
Group III	
Group IV	
Truck Driver	$19.31*
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.

Missouri
Division of Labor Standards
WAGE AND HOUR SECTION

MICHAEL L. PARSON, Governor

Annual Wage Order No. 31

Section 053
LACLEDE 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 8, 2024**

Last Date Objections May Be Filed: **April 8, 2024**

Prepared by Missouri Department of Labor and Industrial Relations

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Asbestos Worker	$25.69*
Boilermaker	$25.69*
Bricklayer-Stone Mason	$54.68
Carpenter	$48.81
Lather	
Linoleum Layer	
Millwright	
Pile Driver	
Cement Mason	$40.32
Plasterer	
Communication Technician	$25.69*
Electrician (Inside Wireman)	$52.71
Electrician Outside Lineman	$25.69*
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Elevator Constructor	$25.69*
Glazier	$42.50
Ironworker	$67.95
Laborer	$39.22
General Laborer	
First Semi-Skilled	
Second Semi-Skilled	
Mason	$25.69*
Marble Mason	
Marble Finisher	
Terrazzo Worker	
Terrazzo Finisher	
Tile Setter	
Tile Finisher	
Operating Engineer	$25.69*
Group I	
Group II	
Group III	
Group III-A	
Group IV	
Group V	
Painter	$25.69*
Plumber	$52.32
Pipe Fitter	
Roofer	$25.69*
Sheet Metal Worker	$53.53
Sprinkler Fitter	$25.69*
Truck Driver	$25.69*
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
LACLEDE County

Section 053

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Carpenter	$25.69*
Millwright	
Pile Driver	
Electrician (Outside Lineman)	$25.69*
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Laborer	$46.64
General Laborer	
Skilled Laborer	
Operating Engineer	$25.69*
Group I	
Group II	
Group III	
Group IV	
Truck Driver	$25.69*
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 01 1000 – 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 01 Specification Sections apply to this Section.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. The Project consists of Vehicular Bridge and Pedestrian Trail.

1. Project Location: Bennett Spring State Park, Laclede County, Missouri.

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 04/10/2025 were prepared for the Project by Bartlett & West, Inc.

C. The Work consists of an offset 2-lane vehicular bridge and roadway work. The Work also consists of approximately 170 lineal feet of 5’-0” wide gravel trail, 50 lineal feet of 6’ wide concrete sidewalk and 3500 lineal feet of 10’-0” wide concrete multi-use trail. The multi-use trail will include several roadway and driveway crossings. The sidewalk/multi-use trail will begin at the Bennett Spring State Park Store and run north, terminating at the existing Bramwell Bridge within the state park.

1. The vehicular bridge work includes grading, subgrade modification, surfacing, signage, bridges, and drainage to roadway to tie back into existing park roads.

2. Construction of trails include removal of existing roadway, grading, subgrade modification, pavement, signage, and drainage structures.

D. The Work will be constructed under a single prime contract.

1.3 WORK UNDER OTHER CONTRACTS (Not Applicable)

1.4 FUTURE WORK (Not Applicable)

1.5 WORK SEQUENCE

A. Contractor shall not leave any portion of pavement which is demolished open for more than 10 working days.

B. The Contractor is required to maintain erosion control and temporary seed cover as needed throughout construction to control soil loss or dust.

C. The work for the project will be substantially complete, ready for use within 205 working days from intent to award.

D. The Contractor shall not begin on-site work until a schedule is approved.

E. No vehicle traffic will be permitted on newly paved surfaces until concrete has reached minimum compressive strength.

F. The Contractor shall be required to use cones or other visible means of marking the boundary of construction or disturbed areas.

G. No subgrade shall be left exposed for more than 10 working days.

H. All work covered on sheets C103, C104, and C105 shall not occur until after November 1.

1.6 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.

2. Driveways and Entrances: Keep driveways and 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.

1.7 OCCUPANCY REQUIREMENTS

A. Full Owner Occupancy: The Owner will occupy the site and existing building during the entire construction period. Cooperate with the Owner during construction operations to minimize conflicts and facilitate owner usage. Perform the Work so as not to interfere with the Owner's operations.

B. Partial Owner Occupancy: The Owner reserves the right to occupy and to place and install equipment in completed areas of the building prior to Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placing of equipment and partial occupancy shall not constitute acceptance of the total Work.

1. The Designer will prepare a Certificate of Partial Occupancy for each specific portion of the Work to be occupied prior to substantial completion.

2. Prior to partial Owner occupancy, mechanical and electrical systems shall be fully operational. Required inspections and tests shall have been successfully completed. Upon occupancy, the Owner will operate and maintain mechanical and electrical systems serving occupied portions for the building.

3. Upon occupancy, the Owner will assume responsibility for maintenance and custodial service for occupied portions for the building.

1.8 OWNER-FURNISHED PRODUCTS (Not Applicable)

1.9 MISCELLANEOUS PROVISIONS (Not Applicable)

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 1000

SECTION 01 2100 – ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements 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. Weather allowances.

C. Related Sections include the following:

1. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders for allowances.
2. Division 01 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.

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 20 “bad weather” days.

END OF SECTION_ 01 2100

SECTION 01 2200 – UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Quantities of Units to be included in the Base Bid are indicated in Section 00 4322 – Unit Prices.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for Unit Prices.

B. Related Sections include the following:

1. Division 01 Section "Allowances" for procedures for using Unit Prices to adjust quantity allowances.
2. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
3. Division 31 Section "Excavation and Fill" for procedures for measurement and payment for Class C Excavation.

1.3 DEFINITIONS

A. Unit Price is a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

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

B. Lump Sum Prices include all necessary material plus costs for delivery, installation, insurance, overhead, incidentals, and profit.

C. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of Unit Prices. Methods of measurement and payment for Unit Prices are specified in those Sections.

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

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 LIST OF UNIT PRICES

A. Unit Price No. 1 – Rock Excavation (Class C Excavation)

1. Description: Excavation General, according to Division 31; Section 31 2300 “Excavation and Fill”.
2. Unit of Measurement: Cubic Yard (CY)
3. Quantity in Bid: 250 CY

B. Unit Price No. 2 – Rock Subgrade Stabilization

1. Description: Rock Subgrade Stabilization, according to Division 31; Section 31 2313 “Subgrade Preparation”.
2. Unit of Measurement: Cubic Yard (CY)
3. Quantity in Bid: 500 CY

END OF SECTION 01 2200

SECTION 01 2600 – CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

B. Related Sections include the following:

1. Division 01, Section 01 2100 "Allowances" for procedural requirements for handling and processing Allowances.
2. Division 01, Section 01 2200 "Unit Prices" for administrative requirements for using Unit Prices.
3. Division 01, Section 01 3115 “Project Management Communications” for administrative requirements for communications.
4. Division 00, Section 00 7213, Article 3.1 "Acceptable Substitutions" for administrative procedures for handling Requests for Substitutions made after Contract award.
5. Division 00, Section 00 7213, 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 Contactor 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 01 2600

SECTION 01 3100 – COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1. Coordination Drawings.
2. Administrative and supervisory personnel.
3. Project meetings.

B. Related Sections include the following:

1. Division 01, Section 01 3200 "Schedules" for preparing and submitting Contractor's Construction Schedule.
2. Articles 1.8.B and 1.8.C of Section 00 7213 "General Conditions" for coordinating meetings onsite.
3. Article 5.4.H of Section 00 7213 "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.

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

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

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

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other Contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule.
2. Preparation of the Schedule of Values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Startup and adjustment of systems.
8. Project Closeout activities.

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

1. 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 00 7213 “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. Project name
7. Name and address of Contractor
8. Name and address of Designer
9. RFI number including RFIs that were dropped and not submitted
10. RFI description
11. Date the RFI was submitted
12. Date Designer's response was received
13. Identification of related DSI or Proposal Request, as appropriate

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 3100

SECTION 01 3115 - 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 01 Specification Sections apply to this Section.

B. Division 01, Section 01 3300 - Submittals

C. Division 01, Section 01 2600 – Contract Modification Procedures

1.2 SUMMARY

A. Project Management Communications: The Contractor shall use the Internet web-based project management communications tool, Trimble Unity Construct 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 location[1] 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 system[2] 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 01 3115

[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 01 3200 – 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 01 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 01 2100 – 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

3.3 SCHEDULE OF SUBMITTALS (Not Applicable)

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 01 3200

SECTION 01 3300 – 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 01 Specification Sections apply to this Section.

B. Division 01, Section 01 3115 “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 01 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
01 3200	Schedules	Construction Schedule
01 3200	Schedules	Schedule of Values
01 3200	Schedules	List of Subcontractors
01 3200	Schedules	Major Material Suppliers
01 5526	Traffic Management Schedule	Shop Drawings
01 5713	Silt Fence	Certification
01 5713	Rock Ditch Check	Product Data
01 5713	Erosion Control Schedule	Construction Schedule
01 5723	Storm water runoff control program SWPPP	Shop Drawings
03 2100	Shop Drawings of Reinforcement Steel	Shop Drawings
03 2100	Epoxy Coating Applicator's Certification of Reinforcing Steel	Certification
03 2100	Steel Manufacturer's Certified Mill Test Report (Coated and Uncoated)	Test Report
03 2100	Epoxy Resin Material (in accordance with Sec 1039)	Certification
03 2100	Documentation of Mechanical Bar Splice Systems and Components	Product Data
03 3000	Cast-In-Place Concrete Mix Design	Certification
03 3000	Cast-In-Place Concrete Mix Fresh and Hardened Properties	Test Report
03 3000	Daily Quality Control Tests	Test Report
03 3000	Cast-In-Place Concrete Mix Cement, Aggregates, Admixtures Materials Certifications	Certification
03 3000	Hot Weather Concreting Procedures	Construction Schedule
03 3000	Cold Weather Concreting Procedures	Construction Schedule
03 3000	Case-In-Place Concrete Method of Cure	Product Data
03 3000	Daily Cast-In-Place Concrete Quality Control Tests	Test Report
03 4100	Prestressed Members	Shop Drawings
03 4116	Precast Concrete Panels	Shop Drawings
03 6000	Type 1 Portland cement	Product Data
05 5200	Railing Components	Shop Drawings
05 5200	Railing Components	Product Data

SPEC SECTION	TITLE	CATEGORY
07 9200	Joint Sealant and Backer Rod	Product Data
09 9656	Epoxy Sealant	Product Data
10 1453	Sign Components	Certification
31 2300	Geotextile for Subsurface Drainage	Product Data
31 2300	Preconstruction Pictures and Videos	Product Data
31 2300	Proof Rolling Field Results	Test Report
31 2500	Erosion control blanket and/or turf reinforcement mat	Certification
31 3716.13	Type II Rock Blanket	Certification
31 6216	Steel Piles	Certification
32 1123	Aggregate for Base Course Gradation, Deleterious and PI	Test Report
32 1123	Aggregate for Base Courses Field Quality Control Test Reports	Test Report
32 1313	ADA Warning Panels	Product Data
32 1313	Epoxy-Coated Steel	Certification
32 1313	Uncoated Steel	Certification
32 1313	Coating application for Epoxy-Coated Steel	Certification
32 1313	Uncoated steel for Box Culverts	Shop Drawing
32 1313	Curing Compounds	Certification
32 1313	Joint filler	Product Data
32 1313	Daily Concrete Paving Quality Control Test Reports	Test Report
32 1313	Concrete Paving Mix Design	Certification
32 1313	Concrete Paving Mix Fresh and Hardened Properties	Test Report
32 1313	Concrete Paving Mix Cement, Aggregates, Admix-tures Materials Certifications	Certification
32 1313	Concrete Paving Concrete Method of Cure	Product Data
32 1313	Daily Concrete Paving Concrete Quality Control Tests	Test Report
32 1313	Concrete Paving Joint Sealant Components	Product Data
32 1540	Crushed Stone Surfacing Aggregate Gradation	Test Report
32 1723	Pavement Markings	Product Data
33 4113	Pipe	Product Data
33 4113	Drainage Fabric	Product Data
33 4213	HDPE Pipe Culverts	Certification
33 4213	RCP Pipe Culverts	Certification
33 4213	CMP Pipe Culverts	Certification
33 4213	Pipe anchors if HDPE is used	Shop Drawings
33 4900	Storm Drainage Structures	Test Report
33 4900	Storm Drainage Structures	Certification
33 4900	Inlet Grate	Product Data
33 4900	Inlet Frame	Product Data

END OF SECTION 01 3300

SECTION 01 3513.31 – 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 01 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.

All construction personnel shall visibly display issued identification cards.

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 not permitted.

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.

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 01 3513.31

SECTION 01 5000 – 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 01 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. Telephone service
4. Sanitary facilities, including drinking water
5. 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. Temporary project identification signs and bulletin boards
6. Construction aids and miscellaneous services and facilities

D. Security and protection facilities include, but are not limited to, to 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. 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.

C. Water: Provide potable water approved by local health authorities.

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. 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. Temporary Water Service: The Owner will not provide water and the contractor will not be allowed to access to the facility.

B. Temporary Electric Power Service: The Owner will not provide electric power.

C. 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.

D. Temporary Telephones: The Owner will not provide telephones and the contractor will not have access to the facility.

E. Temporary Toilets: Use of Owner's existing toilet facilities will not be permitted.

F. Wash Facilities: The Owner will not provide wash facilities. The Contractor is responsible for providing their own wash facilities.

G. Drinking-Water Facilities: The Owner will not provide drinking water facilities. The Contractor is responsible for providing their own drinking water facilities.

H. 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.

B. Storage Facilities: Limited areas for storage of building materials are available onsite. Available storage areas are shown on the drawings. The Contractor shall provide his own security. Specific locations for storage and craning operations will be discussed at the Pre-Bid Meeting and the Pre-Construction Meeting.

C. Construction Parking: Parking at the site will be provided in the areas designated at the Pre-Construction Meeting.

D. 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.

E. 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.

F. 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.

G. Temporary Exterior Lighting: Install exterior yard and sign lights so signs are visible when Work is being performed.

H. 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.

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. 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.

C. Contractor is responsible for providing adequate barriers and signage to prevent pedestrian and vehicular traffic through the construction zone at all times. This may be accomplished through the use of temporary fencing, barricades, or other methods approved by the Engineer. The Contractor will be responsible for all maintenance and replacement throughout construction.

D. 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.

E. 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 significantly worn parts and parts subject to unusual operating conditions.

END OF SECTION 01 5000

SECTION 01 5526- TRAFFIC CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Traffic Management Schedule

2. Traffic Safety Management for Temporary Traffic Control

3. Lane Closure Provisions

4. Work Hour Restrictions

B. Related Sections:

1. Division 10 – Section 10 1453 Traffic Signage.

1.3 PROJECT CONDITIONS

A. Description: The work zone traffic management plan shall be in accordance with applicable portions of Division 100 and Division 600 of the current version of the Missouri Department of Transportation Standard Specifications for Highway Construction.

1.4 PERFORMANCE REQUIREMENTS

A. Performance: Materials, placement, maintenance, and removal of all traffic control devices shall comply the construction plans and Part 6 of the "Manual of Uniform Traffic Control Devices", published by the U.S. Department of Transportation, year 2009 edition, and all current revisions thereto.

1.5 SUBMITTALS

A. Traffic Management Schedule: Traffic management schedules impacting BSSP1 Rd shall be submitted to the engineer for review. This submittal shall be made prior to the start of work and prior to any revisions to the traffic management schedule. The traffic management schedule shall include the proposed traffic control measures, hours traffic control will be in place, and work hours.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 TRAFFIC MANAGEMENT SCHEDULE

A. The Contractor shall notify the engineer of all lane closures, in advance, and keep them notified of all changes to coordinate emergency response routes. A minimum of a 48-hour notice is required prior to any closures and changes in traffic patterns to facilitate construction.

B. The contractor shall notify the engineer two weeks prior to any adjustments in traffic control scenarios.

C. In order to ensure minimal traffic interference, the contractor shall schedule lane closures or temporary traffic control measures for the absolute minimum amount of time required to complete the work. Lanes shall not be closed or infringed upon until material is available for continuous construction and the contractor is prepared to diligently pursue the work until the closed lane is opened to traffic.

3.2 TRAFFIC CONGESTION

A. The contractor shall, upon approval of the engineer, take proactive measures to reduce traffic congestion in the work zone.

3.3 TRAFFIC DELAY AND TRAFFIC SAFETY

A. The contractor shall be responsible for maintaining the existing traffic flow through the job site during construction. If disruption of the traffic flow occurs and traffic is backed up in queues of 15 minute delays or longer, then the contractor shall review the construction operations which contributed directly to disruption of the traffic flow and make adjustments to the operations to prevent the queues from occurring again.

B. Where traffic queues routinely extend to within 500 feet of the ROAD WORK AHEAD, or similar sign, the contractor shall extend the advance warning area, as approved by the engineer.

3.4 WORK HOUR RESTRICTIONS

A. All lanes shall be fully open to traffic during holiday periods, from 12:00 noon on the last working day proceeding the holiday until 9:00 a.m. on the first working day subsequent to the holiday.

B. The contractor shall not perform any construction operation on the roadway, roadbed or active lanes, including the hauling of material within the project limits, during restricted periods, holiday periods or other special events specified in the contract documents.

3.5 DETOURS AND LANE CLOSURES

A. The contractor shall provide changeable message signs notifying motorists of future traffic disruption and possible traffic delays one week before traffic is shifted to the detour or prior to lane closures. The changeable message sign shall be installed at a location as approved or directed by the engineer.

3.6 PLACEMENT OF DEVICES

A. The contractor shall provide and install all traffic control devices as indicated on the Drawings or otherwise directed by the engineer to maintain a safe work zone and facilitate traffic through the work zone.

END OF SECTION 01 5526

SECTION 01 5639- TEMPORARY TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Tree Protection

1.3 PERFORMANCE REQUIREMENTS

A. This work shall include all necessary material, equipment and labor to protect trees, bushes and shrubs necessary to complete the work outlined on the construction plans, in the project specifications or directed by the Owner/Engineer.

PART 2 - PRODUCTS

2.1 TREE PROTECTION FENCE

A. Contractor shall install tree protection fence at locations indicated on the construction plans or when directed by Owner/Engineer. Tree protection fence shall be constructed in accordance with the detail shown on the construction plans.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Tree protection fence shall be installed according to the plans and in accordance with manufacturer's recommendations.

3.2 MAINTAINENCE

A. Tree protection fence devices shall be maintained to ensure proper working conditions. Any protective fencing that is not performing correctly will be replaced at the contractor’s expense.

3.3 REMOVAL

A. Tree protection fence shall be removed entirely upon final completion of the project, unless otherwise directed by the owner's representative.

END OF SECTION 01 5639

SECTION 01 5713- TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Silt Fence
2. Rock Ditch Check
3. Inlet Protection

B. Related Sections:

1. Division 1 – Section 01 5723 Stormwater Runoff Control Program
2. Division 31 – Section 31 2500 Erosion and Sedimentation Controls
3. Division 32 – Section 32 9200 Turf and Grasses

1.3 PERFORMANCE REQUIREMENTS

A. This work shall consist of furnishing, installing, maintaining, and removing temporary pollution, erosion, and sediment control measures; furnishing and placing permanent erosion control features; or a combination of both as shown on the plans or directed by the owner/engineer

1.4 SUBMITTALS

A. Erosion Control Schedule: Include installation schedule that coincides with construction schedule and also complies with approved SWPPP.

PART 2 - PRODUCTS

2.1 SILT FENCE

A. Geotextile fabric shall comply with the physical and chemical requirements of AASHTO M 288 for the specified application, except as modified in this specification. If other materials are used they shall be as specified in the SWPPP.

B. Temporary silt fence geotextile shall be used in supported or non-supported sediment control fencing.

C. Posts may be wood, steel, or synthetic but shall have a minimum length of 4 feet.

2.2 ROCK DITCH CHECK

A. The rock size shall range between 4 inches to 12 inches.

2.3 INLET PROTECTION

A. Inlet checks shall consist of socks filled with rock, or other fillers of sufficient weight to keep the device in place. If other materials are used they shall be as specified in the SWPPP.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions to ensure that the plans are compliant with the SWPPP.

1. Do not begin any earthwork until erosion control devices are in place.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Temporary erosion control devices shall be installed according to the plans and in accordance with manufacturer's recommendations.

3.3 MAINTAINENCE

A. Erosion control devices shall be maintained to ensure proper working conditions. Sediment removal shall be in accordance with local regulations. Any erosion control device that is not performing correctly will be replaced at the contractor’s expense.

3.4 REMOVAL

A. Temporary erosion control devices shall be removed entirely upon final completion of the project, unless otherwise directed by the owner's representative. Permanent seeding shall be established to ensure no sediment erosion caused from this project prior to removal.

3.5 CLEANUP

A. Any dirt, debris, or sediment that is transported onto paved surfaces will be cleaned up by the contractor prior to completion of the project.

END OF SECTION 01 5713

SECTION 01 5723 - STORM WATER RUNOFF CONTROL PROGRAM

PART 1 GENERAL

1.1 DESCRIPTION

A. This section describes general requirements the Contractor shall take to prevent or minimize the transport of sediment or pollutants from the project limits or into bodies of water that are intended for protection, in accordance with the plans, the requirements of applicable permits and regulations, and best available management practices (BMPs).

B. Owner has been issued a General Operating Permit, and is included as Appendix A at the end of these specifications.

C. A SWPPP (Storm Water Pollution Prevention Plan) has been included as Appendix B at the end of these specifications.

1.2 LAND DISTURBANCE PERMITS

A. Contractor shall be the responsible party for implementing and complying with that permit for the construction activities at their job sites. Each Contractor/Subcontractor shall be solely responsible for compliance and costs associated therewith, including those specifically referenced herein.

B. Contractor shall be responsible to amend and maintain the plans that show the various erosion control installations throughout the project and have a copy available on site. An extra set of plans will be provided for documenting the erosion control installations.

C. Owner will provide the Contractor with an Erosion and Sediment Control Plan or Stormwater Pollution Prevention Plan (SWPPP). The Contractor shall comply with all requirements of such permits and the SWPPP, and shall enforce compliance with such requirements by all Subcontractors. The Contractor and all Subcontractors shall certify in writing on the form required by the permit that they understand and shall comply with such permits.

D. Contractor shall allow authorized representatives of federal, state, or local agencies having jurisdiction of this permit, upon presentation of proper credentials, to enter the site where construction activities are located, to obtain samples of any discharge water, to have access to and copy at reasonable times, any records which shall be kept, and to inspect any facilities or equipment.

E. The Contractor shall note that compliance with the requirements contained in the Land Disturbance Permit may require the use of erosion and sedimentation control procedures outside the limits of immediate construction activity.

1.3 SUBMITTALS

A. Submit all proposed erosion control products and materials following the procedures described in Section 01 3300.

B. Submit all forms to be used for inspections, summary log of activity, corrective action report, and other forms or reports identified in the Monitoring Program.

PART 2 PRODUCTS

2.1 STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

A. The Contractor shall modify provided SWPPP in accordance with the requirements specified in the Land Disturbance Permit, if different from the erosion controls shown on the plans.

2.2 OTHER PRODUCTS

A. BMPs to be determined by the Contractor for use in his SWPPP.

PART 3 EXECUTION

3.1 STORM WATER POLLUTION PREVENTION PLAN

A. The Owner prepared erosion and sediment control plans in the Project Drawings. However, the erosion control devices or measures shown on the plans are intended to illustrate typical erosion control measures to be implemented by the Contractor. These references are to be considered when developing the Storm Water Pollution Prevention Plan. Erosion control measures or devices not indicated on the plans or in the specifications do not waive the Contractor's responsibilities associated with the NPDES Storm Water permit nor the Storm Water Pollution Prevention Plan.

B. Comply with the conditions identified in the NPDES Permit that apply to the work under this contract.

C. The Contractor shall be responsible for the compliance of his personnel and subcontractors with the SWPPP and for cooperation with the Owner.

D. Keep the SWPPP on site during construction activity. Make available upon request of a representative of the Owner and/or other regulatory agency.

E. Amend the SWPPP whenever there is a change in construction or operations which may affect the discharge of significant quantities of pollutants to surface waters, groundwaters, or a municipal storm sewer system.

F. Coordinate temporary pollution controls with permanent erosion control features in the contract to the extent practical to assure economical effective and continuous erosion and sediment control throughout the construction and post-construction period.

3.2 DURATION OF CONTRACTOR'S RESPONSIBILITY

A. The Contractor is responsible for water pollution control and permit compliance from the issuance of Notice to Proceed until final completion of the work and during any subsequent maintenance bond period. The Contractor will be released from responsibility for erosion and sediment control for any portion of the job for which a Notice of Termination or similar release has been submitted and accepted by the state or local permit authority, provided that the Contractor does not subsequently do work in such areas that create new disturbances. The notice of termination will not be submitted by the Owner until all permit requirements are met, which includes the requirement that final stabilization be achieved on 100% of the site. Vegetation shall achieve a density of at least 70% of full turf to be considered acceptable as final stabilization.

3.3 INSTALLATION OF CONTROLS

A. Soil stabilizing erosion control measures shall be implemented within 14 calendar days after construction activities have temporarily or permanently ceased on any portion of the site. Exceptions to this requirement are as follows: (a) if implementation of erosion controls is precluded by snow cover, such measures shall be taken as soon as practical after a snowmelt, or (b) a waiver to this requirement is justified and approved by the Engineer in writing, in which case a specific deadline for installing erosion controls shall be established.

B. Contractor may propose alternative methods or materials for any of the specific erosion and sediment controls shown on the plans if such methods provide equal or improved measures of control, as determined by the Engineer. The Contractor shall amend the SWPPP identifying the alternate method or material and a description of maintenance procedures.

3.4 POLLUTION PREVENTION CONTROLS

The Contractor shall obey all requirements for chemical and waste controls.

A. Waste Disposal

1. The Contractor is responsible for disposing of all solid waste from the site in accordance with state law. Solid waste facilities shall be provided on the job site. An adequate number of trash containers shall be located to provide access to all trades.

2. Contractor shall keep job site in an orderly condition. All waste material shall be collected daily and stored in a secure container or removed from the project site. The waste container will be inspected regularly with contents disposed properly by the contractor.

3. No waste oil or other petroleum-based products will be disposed of on site (e.g. buried, poured, etc.); but shall be taken off-site for proper disposal.

B. Hazardous Waste

1. Any hazardous waste material shall be disposed of in the manner specified by local and state regulations and by the manufacturer. Site personnel will be instructed to be aware of this requirement.

2. The Contractor shall notify by telephone and in writing the Department of Natural Resources, Water Pollution Control Program, Post Office Box 176, Jefferson City, MO 65102, 1-800-361-4827, of any oil spills or if hazardous substances are found during the prosecution of work.

C. Sanitary Waste

1. All sanitary waste will be collected from portable units as required and properly disposed of off-site in compliance with local and state regulations.

D. Vehicle Tracking

1. Public streets and sidewalks will be monitored for sediment tracking by construction equipment and trucking operations. If tracking becomes a nuisance or safety issue, Contractor shall sweep the problem surface.

3.02 SPILL PREVENTION AND CONTROL PLAN

A. The Spill Prevention and Control Plan (SPCP) describes measures to prevent, control, and minimize impacts from a spill of a hazardous, toxic, or petroleum substance during construction of the proposed project in the State of Missouri. This plan identifies the potentially hazardous materials to be used during this project; describes transport, storage, and disposal procedures for these substances; and outlines procedures to be followed in the event of a spill of a contaminating or toxic substance.

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

C. Due to the chemical makeup of specific products, certain handling and storage procedures are required to promote the safety of handlers and prevent the possibility of pollution. Care shall be taken to follow all directions and warning for products used on the site. All pertinent information can be found on the Material Safety Data Sheets (MSDS) for each product. The MSDS sheets should be located with each product container they represent. Several product-specific practices are listed in the following sections

D. All paints, solvents, petroleum products and petroleum waste products (except fuels) and storage containers (such as drums, cans or cartons) shall be stored so that these materials are not exposed to storm water. Sufficient practices of spill prevention, control and/or management shall be provided to prevent any spills of these pollutants from entering a water of the state. Any containment system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall also prevent the contamination of groundwater.

E. Petroleum Products

1. All fueling facilities present on the job site shall adhere to applicable federal and state regulations concerning underground storage, above ground storage and dispensers, including spill prevention, control and counter measures.On-site vehicles will be monitored for leaks and receive regular maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed clearly labeled containers. Preferably, the containers will be stored in a covered truck or trailer that provides secondary containment for the products.

2. Bulk storage tanks having a capacity of greater than 55 gallons will be provided with secondary containment. Containment can be provided by a temporary earthen berm or other means. After each rainfall, the contents of the secondary containment area will be inspected by the contractor. If there is no visible sheen on the collected water, it will be pumped around in a manner that does not cause scouring. If a sheen is present, it must be cleaned up prior to discharging the water.

3. Bulk fuel or lubricating oil dispensers shall have a valve that must be held open to allow the flow of the fluid. During fueling operations, the contractor shall have personnel present to detect and contain spills.

F. Fertilizers

1. Fertilizers shall be applied to stimulate vegetation growth as recommended by the manufacturer and in accordance with the contract documents. Once applied, the fertilizer shall be worked into the soil to limit the exposure to storm water

3.03 PRECAUTIONS DURING ADVERSE WEATHER

A. During adverse weather, and against the possibility thereof, the Contractor shall take all necessary precautions so that the work may be properly done and satisfactory in all respects. When required, protection shall be provided by use of tarpaulins, wood and building paper shelters, or other acceptable means. The Contractor shall be responsible for all changes caused by adverse weather.

B. The Engineer may suspend construction operations at any time when, in his judgment, the conditions are unsuitable or the proper precautions are not being taken, whatever the weather conditions may be, in any season. The suspension of construction operations by the Engineer shall not be cause for additional compensation or cost by the Contractor.

3.04 MONITORING PROGRAM (MP)

A. The Contractor shall develop a monitoring program (MP), as identified in the Land Disturbance Permit or identified in other parts of this section.

B. The Contractor shall allow representatives of the Owner, and/or other regulatory agencies to enter upon the construction site, inspect the construction site for compliance, and sample and monitor the construction site discharges.

C. The MP will extend past the completion date for this contract. The Contractor's responsibilities for the MP will cease upon acceptance by the Owner of all work under the contract.

D. Required Inspections conducted by Contractor's designated representative:

1. At least once every seven days. During inactive phases (such as winter when construction activity has temporarily ceased), Owner may approve inspection of the site condition to be made no less than once per month. Owner may require inspection during heavy snow melting periods.

2. Within twenty-four hours of the end of a storm which results in precipitation of 0.5 inches or greater, as measured by the nearest National Weather Service measuring station.

E. All installed BMPs shall be checked for proper installation, operation, and maintenance. Locations where stormwater runoff leaves the site shall be inspected for evidence of erosion or sediment deposition. Deficiencies shall be noted in a report of the inspection and corrected within seven calendar days of the inspection. Generally, the following items are to be inspected during the required inspection:

1. Off-site sediment tracking where vehicles enter and exit.

2. Effectiveness and level of sediment buidup of sediment barriers and ditch checks.

3. Effectiveness and remaining volume of sediment traps and sediment basins.

4. Degradation of drainage courses downstream of stormwater discharge points.

5. Containment ability for spill prevention of pollutants and chemicals on-site.

6. All disturbed areas used for storing materials that are exposed to rainfall including stockpiles for possible sediment transport into drainage courses.

7. Re-vegetated areas or areas covered with erosion control product to confirm erosion control has been achieved.

3.05 CORRECTIVE ACTIONS

A. Devices not functioning properly shall be corrected or replaced. Accumulated sediments shall be removed promptly.

3.06 RECORDKEEPING AND REPORTING

A. Contractor shall maintain all permit required records during the job and shall transmit all necessary records to the Engineer at the completion of the work, including all Contractor and Subcontractor certifications and site inspection records, as well as other records requested by the Engineer.

B. A report of each inspection is to be made and shall contain the following minimum information:

1. Inspector's name
2. Date of inspection
3. Observations relative to the effectiveness of the practices
4. Actions taken or necessary to correct deficiencies
5. List of areas where construction operations have permanently or temporarily stopped.
6. Inspection report to be signed by the Superintendent or their designee.

C. Site inspection reports shall be maintained onsite with the SWPPP or the SWPPP shall contain written documentation of the off-site records storage location.

D. All spills in excess of reportable quantities shall be reported to the appropriate federal, state, and local agencies within 24hours of their occurrence. The Contractor shall maintain a listing of all such agencies onsite within the SWPPP and in easy reference for onsite personnel. Spills that pose an immediate threat to public safety or contamination of a water body shall be reported immediately to designated first response authorities.

E. Corrective actions must be undertaken within 48 hours to prevent further unauthorized discharges.

3.07 COMPLETION REQUIREMENTS

A. Contractor shall notify the Owner upon completion of the final stabilization of the construction site.

B. Once stabilization is confirmed by Owner, BMPs and other control measures shall be completely removed from the site when they are no longer needed, unless they are approved by the Engineer to remain in place for permanent stabilization or biodegradation (i.e. erosion control blankets).

C. Contractor shall certify in writing to the Owner the completion of construction that its construction activity has been in compliance or has been modified to comply with the requirements of the General Permit and the SWPPP.

END OF SECTION 01 5723

SECTION 02 4100—DEMOLITION

PART 1 GENERAL

1.1 WORK INCLUDED

A. The removal and or reuse, salvage and disposal of materials and equipment necessary for the work to be performed as shown on the Drawings and as specified herein.

B. Existing buildings, structures, boxes, pipes, pavements, curbs, and other items are to be removed, altered, salvaged, and disposed of as specified herein or indicated in the drawings.

C. Equipment, material, and piping, except as specified to be salvaged for the Owner, or removed by others, within the limits of the demolition, excavations, and backfills, will become the property of the Contractor and shall be removed from the project site. The salvage value of this equipment, materials, and piping shall be reflected in the contract price.

1.2 PROCEDURES

A. Procedures to be used for the removal of all types of materials shall provide for careful removal and disposition of materials specified to be salvaged, protection of property which is to remain undisturbed, coordination with other work in progress, and timely disconnection of utility services. Existing property which is damaged by the Contractor’s operations shall be repaired or replaced in kind by the Contractor at no additional cost to the Owner.

B. Existing Utilities: The Contractor shall notify the Owner and other proper authorities concerned not less than seven days before starting work in any area. The Contractor shall furnish all necessary information as to the nature and extent of the work and shall obtain their cooperation and instructions in locating and protecting all underground pipes, cables, and other utilities. All utility line locations shown on the Drawings are approximate.

C. Perform the work in a manner that will not damage parts of the structure not intended to be removed or to be salvaged for the Owner. If, in the opinion of the Owner's Representative, the method of demolition used may endanger or damage parts of the structure or affect the satisfactory operation of the facilities, promptly change the method when so notified by the Owner's Representative.

D. Explosives: The use of explosives will not be permitted.

1.3 SUBMITTALS

A. Shop Drawings: Indicate demolition and removal sequence and location of salvageable items. Include proposed method of demolition and provisions for erosion, dust, and noise control.

B. Project Record Documents: Accurately record actual locations of capped utilities and subsurface obstructions. Indicate what fill materials were used in backfilling. Information is to be recorded in drawing form.

C. Salvaged Material Data: Submit description of all savaged materials, inspection data, and parts lists.

PART 2 PRODUCTS

2.1 MATERIALS

A. Materials noted to be removed and not relocated, salvaged or reused in the project shall be removed from the construction site and disposed of by the Contractor. Salvaged materials shall be delivered to the Owner's designated location.

B. Do not reuse material salvaged from demolition work on this project, except as specifically shown or specified.

PART 3 EXECUTION

3.1 GENERAL

A. During removal operations all persons and property shall be protected from injury or damage. The work shall proceed in a manner that will minimize the generation and spread of dust, flying particles and objectionable odors.

3.2 PROTECTION

A. Before beginning any cutting or demolition work, the Contractor shall carefully survey the existing work and examine the Drawings and specifications to determine the extent of the work. The Contractor shall take all necessary precautions to insure against damage to existing work to remain in place, to be reused, or to remain the property of the Owner, and any damage to such work shall be repaired or replaced as approved by the Engineer at no additional cost to the Owner. Repairing shall mean the restoration of a surface or item to a condition as near as practicable to match the existing adjoining surfaces unless otherwise noted, detailed, or specified. When repairing involves painting, special coatings, vinyl fabric, or other applied finish, refinish the entire surface plane (i.e., wall or ceiling), unless complete refinishing of the entire space is scheduled or specified. Repairing includes cleaning of soiled surfaces.

B. Erect, and maintain temporary barriers and security devices, including warning signs and lights, and similar measures, for protection of the public, Owner, Contractor's employees and existing improvements to remain. Method and materials of the partitions including adequate bracing shall be submitted to the Engineer for review.

C. Provide temporary weather protection, where required.

D. Mark location of utilities.

3.3 DISPOSITION BY CLASSIFICATION

A. Disposition of materials and equipment shall be indicated on the plans by the following designations:

1. Reinstall: Material or equipment to be reinstalled into the work shall be carefully removed from the existing location, shall be cleaned and otherwise readied for reuse, and shall be protected from damage. Such items shall be reinstalled in accordance with applicable sections of these specifications covering new items of similar categories.

2. Salvage: Materials and equipment to be salvaged shall be carefully removed, cleaned and delivered to a location on Owner's premises as designated by the Engineer or Owner. Final list of items to be salvaged is subject to the Owners review.

3. Remove: Materials and equipment to be removed shall be considered scrap and shall be disposed of by the Contractor. Removed concrete shall be disposed of off-site unless otherwise directed by the Owner or his representative. Final list of items to be scrapped is subject to the Owners review.

4. Abandon: Materials and equipment to be abandoned in place shall be properly taken out of service according to the methods identified in the project specifications.

3.4 CLEAN-UP

A. Debris and rubbish: Remove debris and rubbish from the site daily.

B. Debris Control: Remove and transport debris in a manner as to prevent spillage on streets or adjacent areas.

C. Regulations: Local regulations regarding hauling and disposal apply.

3.5 REMOVALS – GENERAL

A. All pavement to be removed including existing trails, sidewalks, and driveways shall be carefully removed. Contractor shall prevent the breaking and cracking of adjacent pavement beyond the limits of trench and final pavement replacement, as detailed by the saw cutting of pavement (full depth second cut) prior to removal.

B. All removed storm sewer pipes indicated on the plans to be removed shall become the property of the contractor unless otherwise indicated by the owner during the time of construction.

C. All other structures to be removed by the contractor as indicated on the plans shall be hauled off by the contractor and properly disposed of.

END OF SECTION 02 4100

SECTION 03 2100 – REINFORCEMENT BARS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Uncoated reinforcing steel for concrete structures

2. Epoxy coated reinforcing steel for concrete structures

B. Related Sections:

1. Division 03: Section 03 3000 Cast-in-Place Concrete

2. Standard Specifications: MoDOT Standard Specifications, 2022
   a. NOTE: Method of Measurement or Basis of Payment included in Standard Specifications do NOT apply.
   b. https://www.modot.org/missouri-standard-specifications-highway-construction

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. A185 - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete

2. A615 - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

B. American Concrete Institute (ACI)

1. 315 - Manual of Concrete Practice – Details and Detailing Concrete Reinforcement

2. 318/318R - Building Code Requirements for Structural Concrete and Commentary

C. American Association of State Highway and Transportation Officials (AASHTO)

1. M 31 – Standard Specification for Deformed and Plain Carbon and Low-Alloy Steel Bars for Concrete Reinforcement

D. Missouri Standard Specifications for Highway Construction, Sections 706, 1036 & 1039 (https://www.modot.org/missouri-standard-specifications-highway-construction).

1.4 SUBMITTALS

A. Shop Drawings:

1. Submit shop drawings of reinforcing steel under provisions of Section 01 3330. Indicate size, spacing, and location of reinforcing steel and wire fabric, bending and cutting schedule, splicing, and supporting and spacing devices.

B. Documentation:

1. Documentation of uncoated steel shall include the steel manufacturer's certified mill test report showing complete chemical and physical test results for each heat.

2. Documentation of coated steel shall include the same requirements as stated above for uncoated steel. Additional documentation for coated bars shall include the coating applicator's certification that all material used, the preparation of the bars, coating and curing are in accordance with ASTM A 775/A 775M. The certification shall include or have attached, specific results of tests of coating thickness and flexibility of coating.

C. Documentation of mechanical bar splice systems and components shall be in accordance with Section 706.3.3.1 of the current version of the Missouri Standard Specification for Highway Construction (https://www.modot.org/missouri-standard-specifications-highway-construction).

PART 2 - PRODUCTS

2.1 BARS

A. All reinforcement bars shall conform to the requirements of ASTM A615. All bars shall be deformed or smooth bars and shall be Grade 60. Reinforcing steel shall be accurately cut and bent to the dimensions and shapes shown on the drawings, preferably at the mill or shop. Field bending of bars partly embedded in concrete is not permitted. Cutting and bending tolerances shall be in accordance with the Concrete Reinforcing Steel Institute's manual of standard practice. Welding of reinforcing steel shall not be permitted.

2.2 WELDED WIRE

A. All welded wire reinforcement shall conform to the requirements of ASTM A185. Welded wire having 6 gage or larger wire shall be delivered to the job in flat sheets.

2.3 EPOXY RESIN

A. Epoxy shall be furnished as a system in accordance with the requirements of ASTM C 881, Type IV, and Grade 3. When a cartridge dispensing system is used the epoxy shall have a gel time as stated in ASTM C 881 paragraph 5.2. Epoxy bonding agents are not approved for sustained tension loads.

PART 3 - EXECUTION

3.1 HANDLING AND STORAGE

A. Reinforcing steel shall be protected from damage at all times. Before being placed in the work, it shall be free from dirt, oil, paint, grease, loose mill scale, thick rust, dried mortar and other foreign substances. Thin powdery rust need not be removed. Exposed reinforcing steel intended for bonding with future work shall be protected from corrosion by adequate covering.

3.2 REINFORCING STEEL PLACEMENT

A. Reinforcing bars shall be positively secured against displacement.

1. All reinforcing steel required for bridge decks and top slabs of culverts with greater than a 4 foot span, shall be held securely in the correct position with approved metal or plastic bar supports and ties.

2. For bridge decks and top slabs of culverts, bars in the top mat shall be tied at all intersections except where spacing is less than or equal to 12 inches in each direction, in which case alternate intersections shall be tied. At other locations, the bars shall be firmly tied at alternate crossings or closer. The steel shall be tied in the correct position with proper clearance maintained between the forms and the reinforcement.

B. The reinforcing steel shall be tied in correct position and inspected before any concrete is placed. Such inspection will not relieve the Contractor of the responsibility for constructing the unit in accordance with the drawings.

3.3 EPOXY COATED REINFORCING STEEL PLACEMENT

A. Epoxy coated reinforcing steel shall not be flame-cut

B. All systems for handling epoxy-coated bars shall have padded contact areas.

C. Epoxy-coated bars shall be held securely in the correct position with approved metal bar supports coated with plastic or epoxy or on plastic bar supports, and shall be held in place by use of plastic-coated tie wires or molded, plastic clips. When placing epoxy-coated bars, the bars shall be prevented from coming into contact with other steel items such as drains and shear connections.

3.4 SUPPORTS

A. Reinforcing steel shall be held in position during the placing of concrete by spacers, chairs or other approved supports. These supports shall be manufactured and placed in accordance with the typical details shown on the drawings. The number, type and spacing of supports shall conform to ACI 315 if not indicated on the drawings. Plastic bar supports shall meet or exceed the load carrying capacity of, and use the same spacing as, metal bar supports, and shall be molded in a configuration that does not restrict concrete flow and consolidation around and under the bar support.

3.5 SPLICES

A. Bars shall not be spliced except where shown on the drawings or permitted by the engineer.

1. The use of splices shall be avoided at points of maximum stress. Where possible, splices shall be staggered and arranged to develop the full strength of the bar. Splices shall be made by lapping the bars a length at least equal to that shown on the drawings or as authorized by the engineer.

2. Welded wire reinforcement shall be continuous and shall have joints wire-tied and lapped at least one full mesh.

3. Mechanical bar splice systems, as shown on the plans, shall be capable of developing 125 percent of the specified yield strength of the bar being spliced and shall be installed in accordance with the manufacturer's recommendations

a. Reinforcing bar lengths shown in the bill of reinforcing steel may require modification to accommodate the specific mechanical bar splice system that will be used. The contractor shall determine the actual reinforcing bar lengths to accommodate the manufacturer's recommendations for installation of the mechanical bar splices.

3.6 CLEARANCES

A. Care shall be exercised to maintain proper clearance between the forms and the reinforcement. Measurements to reinforcing steel shall be made to the centerline of bar, except where clear distance from face of concrete is shown on the drawings. Concrete covering over steel reinforcement shall be not less than the following, unless otherwise shown on the drawings:

Location	Clearance (inches)
Concrete cast against and permanently exposed to earth	3
Concrete exposed to earth or weather -	
#5 bars or smaller	1½
#6 bars or larger	2
Concrete not exposed to weather or	

not in contact with the ground 1½

3.7 REINFORCEMENT ANCHORING

A. Where required to anchor reinforcement into existing concrete, pre-drill holes, clean any dust and debris out of hole, and insert reinforcement bars with epoxy resin. Resin to be applied per manufacturer's requirements.

END OF SECTION 032100

SECTION 03 3000- CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. All structural concrete required for project with the exception of any precast concrete elements.

B. Related Sections:

1. Division 03: Section 03 2100 Reinforcement Bars.

2. Division 33: Section 33 4900 Storm Drainage Structures.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM)

C31	Standard Practice for Making and Curing Concrete Test Specimens in the Field
C33	Standard Specification for Concrete Aggregates
C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
C40	Standard Test Method for Organic Impurities in Fine Aggregates for Concrete
C42	Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
C94	Standard Specification for Ready-Mixed Concrete
C127	Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate
C128	Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate
C138	Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
C143	Standard Test Method for Slump of Hydraulic Cement Concrete

C150	Standard Specification for Portland Cement
C171	Standard Specification for Sheet Materials for Curing Concrete
C173	Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
C192	Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory
C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
C260	Standard Specification for Air-Entraining Admixtures for Concrete
C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
C494	Standard Specification for Chemical Admixtures for Concrete
C1064	Standard Test Method for Temperature of Freshly Mixed Portland Cement Concrete

B. American Concrete Institute (ACI)

211.1	Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete
224R	Control of Cracking in Concrete Structures
301	Specifications for Structural Concrete for Buildings
304R	Guide for Measuring, Mixing, Transporting and Placing Concrete
305R	Hot Weather Concreting
306R	Cold Weather Concreting
309R	Guide for Consolidation of Concrete
318/318R	Building Code Requirements for Structural Concrete and Commentary
347	Guide to Formwork for Concrete

C. American Association of State Highway and Transportation Officials (AASHTO)

M182	Burlap Cloth Made From Jute or Kenaf

1.4 SUBMITTALS

A. Reports covering the source, quality, and proportions of the concrete materials used in the design mix should include the following information:

1. Compressive strength (f'_c) based on 7-day and 28-day compression tests in accordance with ASTM C39
2. Slump determined in accordance with ASTM C143
3. Air content, determined in accordance with ASTM C138, C173 or C231
4. Unit weight and yield determined in accordance with ASTM C138

5. Water-Cementitious materials ratio
6. Weight and volume of each aggregate
7. Weight and volume of portland cement
8. Weight and volume of added water. Water added at the plant shall account for the net moisture in both the coarse and fine aggregate.
9. Type and quantity of each admixture
10. Specific gravity, absorption and gradation of each aggregate in accordance with ASTM C127, ASTM C128 and ASTM C33.
11. Daily concrete quality control tests must be accomplished by an individual certified as ACI Concrete Field Testing Technician, Grade 1, or equivalent program and daily results must be provided to the Engineer.

B. Certifications:

1. Provide certification that portland cement used complies with ASTM C150. Provide brand, type and composition of cement used.
2. Provide certification that aggregates comply with ASTM C33. State amount of deleterious substances. Identify certifications for and tests of actual materials to be used in the work. State basis of determining that alkali reactivity potential is negligible.
3. Provide certificate of compliance with these specifications from the manufacturer of the concrete admixtures.
4. Provide delivery tickets for ready-mix concrete or weighmasters certificate per ASTM C94, including weights of cement and each size aggregate and amount of water added at the plant. Record the amount of water added on the job on the delivery ticket.

PART 2 - PRODUCTS

A. General

Proportioning of the individual components of batched concrete shall be within the following tolerances of the submitted concrete mix design weights.

Item	Tolerance (%)
Cement	0 to +4
Fine Aggregate	±2
Coarse Aggregate	±2
Water	±1
Admixtures	±3

The Contractor shall use whatever means necessary to ensure concrete delivered to the project is properly batched with approved kinds and quantities of materials.

B. Cement

Cement shall conform to ASTM C150, Type I or Type II. The minimum quantity of portland cement in the concrete shall be as indicated in the following table:

Maximum Nominal Coarse Aggregate Size (inch)	Minimum Cement Content (pounds/cu. yd.)
3/8	635
1/2	611
3/4	588
1	564

C. Aggregates

1. General

Aggregates and final gradation shall comply with ASTM C33. The ratio of fine to total aggregates, based on solid volumes (not weights), shall be as follows:

Minimum Coarse Aggregate Size	Maximum Ratio	Ratio
3/8 inch	0.45	0.60
1/2 inch	0.40	0.55
3/4 inch	0.35	0.50
1 inch	0.30	0.46

2. Fine Aggregate

Fine aggregate shall be a fine granular material naturally produced by the disintegration of rock of a siliceous nature or manufactured from an approved limestone or dolomite source, and shall conform to the following sieve analysis:

Sieve Size	Percent Passing
3/8 inch	100
No. 4	95-100
No. 8	80-100
No. 16	50-85
No. 20	40-75
No. 30	25-60
No. 50	5-30
No. 100	0-10

The sand shall not have more than 45% retained between any two consecutive sieve sizes. Fineness modulus shall not be less than 2.3 nor more than 3.1.

The amount of deleterious substances in fine aggregate shall not exceed the following limits:

Item	Maximum Percent by Weight of Total Sample
Clay Lumps and Shale	0.25
Material Finer than No. 200 Sieve	2.00
Coal and Lignite	0.25
Other Deleterious Material	0.10

Fine aggregate shall be free of injurious amounts of organic impurities. Fine aggregates subjected to ASTM C40 for organic impurities and producing a color darker than the standard shall be rejected.

Fine aggregate shall be free of material that could react harmfully with alkalis in the cement. If such materials are present in injurious amounts, the fine aggregate shall be rejected, or shall be used with the addition of a material that has been shown to inhibit undue expansion due to the alkali-aggregate reaction.

Fine aggregate subjected to five cycles of the soundness test (ASTM C88) shall show a loss of not greater than 8% when sodium sulfate is used or 10% when magnesium sulfate is used.

3. Coarse Aggregate

Coarse aggregate shall be washed gravel or crushed stone produced from rock of uniform quality, and shall be approved by the Engineer. Coarse aggregate shall conform to the following sieve analysis unless otherwise approved:

Sieve Size	Percent Passing
1 inch	100
3/4 inch	90-100
3/8 inch	25-55
No. 4	0-10
No. 8	0-5
No. 200	0-2

The amount of deleterious substances in coarse aggregate shall not exceed the following limits:

Item	Maximum Percent by Weight of Total Sample
Shale	1.00
Chert in Limestone	4.00
Other Deleterious Material	1.00

Coarse aggregate subjected to five cycles of the soundness test (ASTM C88) shall show a loss of not greater than 8% when sodium sulfate is used or 10% when magnesium sulfate is used.

D. Water

1. Use water and ice in concrete that is clean and free from injurious quantities of organic matter, alkali, salts, and other impurities, which might reduce the strength, durability, or otherwise adversely affect the quality of the concrete.
2. Water approved by the Missouri Department of Natural Resources for drinking purposes may be considered satisfactory for the purpose. If in the judgment of the Engineer the water for mixing or curing is not clean or otherwise free from injurious quantities or impurities, testing may be required.

E. Concrete Mixtures

1. Proportion mixtures to provide normal-weight concrete with the following properties:
   a. Compressive Strength (28 Days): 4000 psi.
   b. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45
   c. Slump Limit: 4 inches, plus or minus 1 inch.

F. Concrete Admixtures

1. General

   All concrete admixtures shall be from one manufacturer and shall be compatible. The admixture dosage rate, batching method, and time of introduction to the mix shall comply with these specifications and with the manufacturer's recommendations. Neither calcium chloride nor an admixture containing chloride from sources other than impurities in admixture ingredients will be acceptable.

2. Air-Entraining Admixture

   The air-entraining admixture shall conform to ASTM C260, shall contain no chlorides and shall be subject to the Engineer's approval.

3. Water-Reducing Admixture

   The water-reducing admixture shall conform to ASTM C494, Type A, shall contain no chlorides and shall be subject to the Engineer's approval.

4. Superplasticizer Admixture

   A superplasticizer may be used at the option of the Contractor. The superplasticizer admixture shall comply with ASTM C494, Type F or G, shall contain no chlorides and shall be subject to the Engineer's approval. Superplasticizer may be added to the concrete at the plant or on the job site and shall be mixed in accordance with the admixture manufacturer's recommendations. The superplasticizer dose shall be accurately proportioned and shall be easily verifiable for each concrete load. When permitted by the Engineer, redosing of concrete with superplasticizer shall be done only once. Redosing procedures shall be as recommended by the admixture manufacturer.

   Slump shall not exceed 4 inches before superplasticizer is added. Slump shall not exceed 7 inches after the superplasticizer has been added.

PART 3 - EXECUTION

A. General

1. All ready-mixed concrete shall conform to ASTM C94 and be furnished by a reputable permanent concrete plant. The supplier shall have an adequate number of modern transit mix trucks to ensure delivery of concrete as required for the schedule of placement. The plant shall be located within a reasonable distance from the project so travel time is 30 minutes or less. Concrete shall be handled and preserved in its "batched" proportion during transportation. Mixing time shall not exceed 45 minutes and water shall not be added during transportation. Concrete improperly cared for or mixed in the truck longer than 45 minutes shall be disposed of away from the project. With the Engineer's approval and in accordance with ASTM C94, water can be added on-site within the limits of these specifications to obtain the specified slump.

2. Proportion mixtures to provide normal-weight concrete with the following properties:
   a. Compressive Strength (28 Days): 4000 psi.
   b. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45
   c. Slump Limit: 4 inches, plus or minus 1 inch.

3. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:
   a. Air Content: 6 percent plus or minus 1 percent.

B. PREPARATION

1. Notify the Engineer of readiness to place concrete in any portion of the work. This notification shall be such time in advance of the operation as the Engineer deems necessary to allow observation of the work at the location of the proposed concrete placing. Failure to provide sufficient advance notification will be cause for delay in placing until observation can be completed. Forms, reinforcement, screeds, ties, anchors, inserts, and other embedded items shall be secured, inspected and approved before the Contractor may proceed with concrete placement.

2. All concrete shall be placed in a manner and with adequate equipment which shall be subject to the Engineer's approval. Equipment for placing concrete may include flumes, tremies, cranes or concrete pumps for placing concrete; vibrators, hand tool and finishing equipment for manipulation as needed.

3. Coordinate in advance of concrete placement the sequence of placement and availability of concrete, to assure that construction joints will occur only as designed or specified. Provide the Engineer with a copy of the sequence of placement for approval in advance of placement.

4. Schedule sufficient equipment for continuous concrete placement within the predetermined sequence limits. Provide for backup equipment and procedures to be taken in case of an

interruption in placement. Provide backup concrete vibrators at the project site and test concrete vibrators the day before placing concrete.

C. FORMWORK

1. General

   Forms shall be designed, constructed and maintained so as to ensure that after removal of the forms, the finished concrete members shall have true surfaces free of waviness or bulges, conforming accurately to the shapes, dimensions, lines, elevations and positions called for on the drawings. The design and construction of the form work shall be the responsibility of the Contractor. Forms shall be thoroughly cleaned before each use and of a material that is non-reactive with the concrete. Joints and forms shall be sufficiently tight to prevent leakage of mortar during placing of concrete. Forms shall also provide for all openings as shown on the drawings. Triangular moulding, smooth on three sides and having ¾ inch width on each of the two form sides, shall be used to bevel all exposed edges of the structure, except where special bevels are shown on the drawings.

2. Surface Preparation

   Plywood and other wood surfaces not subject to shrinkage shall be sealed against absorption of moisture from the concrete by either a field applied approved form oil or sealer or a factory applied non-absorptive liner non-reactive with the concrete. When forms are coated to prevent bond with concrete, it shall be done prior to placing of the reinforcing steel. Excess coating material shall not be allowed to stand in puddles in the forms nor allowed to come in contact with concrete against which fresh concrete will be placed. Where cast finishes are required, materials which will impart a stain to the concrete shall not be applied to the form surfaces. Do not apply form release agent where concrete surfaces receive special finishes or applied coatings which may be affected by the agent. Tolerances for formed surfaces shall be as specified in ACI 301 and 347.

3. Alternative Formwork

   Trenches in earth may be used as forms upon approval by the Engineer. Under no circumstance shall they be used when side walls crumble or if footing cannot be poured on level ground. If the earth walls will not allow proper pouring conditions, conventional forms will be required. Subgrade shall be fine graded and moistened if necessary prior to placing concrete.

4. Form Ties

   Ties and spreaders and all metal appliances used inside of forms to hold them to correct alignment and location shall be so constructed that after removal of forms, the metal may be removed to a depth of at least one inch from the surface of the concrete. Metal tie rods used inside the forms where concrete will have an exposed surface shall be a type which will not produce a cavity at the surface of the concrete greater than 1½ inches in diameter. Bolts and rods used as ties shall not be removed by pulling them through the concrete. Wire ties and pipe spreaders will not be permitted, and metal or wood spreaders which are separate from form ties shall be removed as concrete is being placed.

D. PLACEMENT PROCEDURES

1. General

Concrete placement shall conform to ACI 304R and 224R as modified by these specifications. Concrete shall be of such consistency and composition that it can be worked readily into the forms and around the reinforcement without excessive vibrating and without permitting the materials to segregate or free water to collect on the surface. Concrete which has partially hardened or has been contaminated by foreign materials shall not be deposited. Concrete shall be placed in a logical sequence that will permit efficient operation, and shall provide structural continuity and strength required. Concrete shall be deposited continuously with no interruption in excess of 45 minutes between the placement of contiguous portions of concrete, or in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness within the section. If a section cannot be placed continuously, construction joints shall be located at points as provided for in the drawings or as approved by the Engineer. For proper compaction, concrete shall be placed in approximately horizontal layers not to exceed 2'-0".

Do not place concrete until all free water has been removed from out of the forms and clear of the work. Do not place concrete during rainstorms. In case of pending inclement weather, prepare temporary covers to protect freshly placed and finished surfaces from surface damage. Keep sufficient protective covering ready at all times for this purpose. Do not permit free or storm water to flow over surfaces of concrete to injure the quality or surface finish.

Deposit concrete at or near its final position to avoid segregation caused by rehandling or flowing. Do not deposit concrete in large quantities in one place to be worked along the forms with a vibrator. Concrete shall not be moved laterally more than 5 feet after placement in the forms.

Do not drop concrete freely into place from a height greater than 5 feet. Use an approved system of tremies or pumps where the drop exceeds these limits.

Embedded screeds may be used unless otherwise called for. Screeds shall be accurately set and held in place with approved materials and with approved methods. Screeds must be removed and voids filled while concrete is plastic.

2. Vibration

All concrete shall be consolidated by vibration in accordance with ACI 309R so that the concrete is thoroughly worked around the reinforcement, around embedded items, and into corners of forms, eliminating all air and water pockets which may cause honeycombing, pitting, or planes of weakness.

Vibrators shall be of the high-frequency internal type, and the number in use shall be ample to consolidate the incoming concrete to a proper degree within 15 minutes after it is deposited in the forms. Mechanical vibrators shall have a minimum frequency of 4500 revolutions per minute and shall be operated by competent workmen. A spare vibrator shall be kept on the job site during all concrete placing operations.

Over-vibrating or the use of vibrators to transport concrete within forms shall not be allowed. Vibrators shall be inserted and withdrawn at many points, generally from 18 to 30 inches apart. At each insertion, the duration shall be sufficient to consolidate the concrete but not over-vibrated to cause segregation, generally from 5 to 15 seconds duration. Under no circumstances shall vibrators penetrate or disturb previously placed concrete that has taken initial set. For slabs or footings on grade, the vibrator should not make contact with the subgrade.

3. Finishing Concrete

All voids in horizontal surfaces are to be filled during finishing operation of plastic concrete. Finish shall be of specified texture and uniform in color and appearance as approved by the Engineer. Avoid over-finishing, late finishing, re-watering and other techniques that may cause "crazing". Initiate the curing process as soon as surface strength will permit.

Surface finish shall begin immediately following removal of the forms. Form tie cavities, holes, honeycomb spots and other defects shall have all loose material removed, be thoroughly cleaned, saturated with water, carefully patched with an approved mortar or grout and satisfactorily cured. Break off all "fins" and irregular projections and grind as required for uniform appearance. Grind all form "off-set" where concrete will be visible after construction is complete.

4. Curing

Freshly deposited concrete shall be protected from premature drying and excessively hot or cold temperatures, and shall be maintained with minimum moisture loss at a relatively constant temperature for the period of time necessary for the hydration of the cement and proper hardening of the concrete.

Initial curing shall immediately follow the finishing operation. One of the following materials or methods shall be used and as approved by the Engineer:

a. Ponding or continuous sprinkling using a regulated water application rate providing complete surface coverage with a minimum of runoff

b. Moisture-retaining fabric coverings such as burlap, cotton mats or rugs kept continuously wet

c. Sand or other approved covering kept continuously wet

d. Impervious paper or plastic sheeting material, such as polyethylene film, conforming to ASTM C171

e. Continuous steam not exceeding 150° F or vapor mist bath

f. Chlorinated rubber type membrane curing compound conforming to ASTM C309 may be used in lieu of water on concrete which will not be covered later with mortar or additional concrete. Membrane curing compound shall be spray applied at coverage of not more than 150 square feet per gallon. Unformed surfaces shall be covered with curing compound within 30 minutes after final finishing. If forms are removed before the end of the specified curing period, curing compound shall be immediately applied to the formed surfaces before they dry out. Curing compound shall be suitably protected against abrasion during the curing period.

Final curing methods shall be approved by the Engineer and may be the same as the initial process. The final curing shall continue for not less than 5 days unless the concrete compressive strength shown on the drawings has been reached and verified through additional test cylinders.

5. Construction Joints

All keyed and other construction joints shall be constructed as shown on the drawings. Joints not indicated on the drawings shall be so made and located as to least impair the strength of the structure and shall be approved by the Engineer. Where a joint is to be made, the surface of the concrete shall be thoroughly cleaned and all laitance removed; hand wire brushing is required as a minimum to remove laitance.

E. SPECIAL PLACEMENT PROCEDURES

1. Hot Weather Concreting

Details of concrete placement, curing and protection shall be submitted for review and approval when the weather forecast predicts temperatures of above 90º F. Ingredients, production methods, handling, placing, protection, and curing shall be in accordance with ACI 305R in order to prevent excessive concrete temperatures or water evaporation. Concrete shall not be placed when the evaporation rate is expected to be greater than 0.2 pounds per square foot per hour as determined by Figure 2.1.5 in ACI 305R. The mixed concrete when placed in the forms shall have a temperature no higher than 90º F. The concrete shall be protected with wet burlap mats or other approved materials as soon as it has hardened sufficiently to allow their placement. There will be no additional reimbursement to the Contractor for costs incurred for placing concrete in hot weather.

Suggested precautions to take during hot weather include but are not limited to:

1. Schedule placing and finishing of concrete during hours in which the ambient temperature will be lower than 90º F
2. Forms and reinforcing kept cool with acceptable methods such as covering with wet burlap for at least 12 hours prior to placing of concrete
3. Use ice as a water source during mixing or added at site
4. Use Type II portland cement which has a lower heat of hydration

2. Cold Weather Concreting

Details of concrete placement, curing and protection shall be submitted for review and approval when the weather forecast predicts temperatures of below 50º F. Ingredients, production methods, handling, placing, protection, and curing shall be in accordance with ACI 306R. Concrete shall not be placed when the temperature is below 35º F. Concrete shall not be placed on frozen ground or against surfaces with temperatures lower than 35º F. The temperature of concrete as mixed and delivered shall be at least 55º F. The temperature of concrete as placed shall be at least 50º F. The temperature of concrete shall be maintained at 50º F for at least 3 days and the formwork not removed for at least 6 days or unless the concrete compressive strength shown on the drawings has been reached and verified through additional test cylinders. There will be no additional reimbursement made to the Contractor for costs incurred for placing concrete during cold weather.

Suggested precautions to take during cold weather include but are not limited to:

1. Heat aggregate or water or both. Aggregates shall not be heated higher than 150º F. The temperature of the aggregates and water combined shall not be higher than 100º F when the cement is added. The apparatus used shall heat the mass uniformly and avoid hot spots that will burn the material.
2. Curing within a weatherproof enclosure. When dry heat is used, at least 40% humidity shall be maintained. The exposed surfaces of the concrete shall be kept moist either by the application of steam or wet burlap mats. When the curing is complete, the temperature within the enclosure shall be lowered gradually at a rate not to exceed 3º F per hour, until the outside temperature is reached.
3. Insulated forms may be used at approved locations in lieu of enclosures. The Contractor shall secure written approval of the type of insulation, method of installation and the locations at which it is proposed for use.

F. CONSTRUCTION PROGRESSION

Do not place backfill until the concrete has obtained a compressive strength equal to the compressive strength specified on the drawings. Place the backfill uniformly on both sides where backfill is to be placed on both sides of the concrete.

Falsework and form removal from any structural concrete unit shall not be started until the concrete has attained at least 75 percent of the 28-day compressive strength as determined by cylinders made and cured in the field.

G. SPECIFIC TOLERANCES

The top of concrete for all piers shall be level and shall be the same elevation with a maximum differential of ¼ inch from the highest to the lowest. Anchor bolts when required shall be placed in accordance with the manufacturer's recommendations.

H. FIELD QUALITY CONTROL

1. Testing Agency: Contractor shall engage a qualified testing agency to perform tests and inspections.
2. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
   a. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.
      1) When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
   b. Slump: ASTM C 143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
   c. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

d. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when it is 80 deg F and above, and one test for each composite sample.
e. Compression Test Specimens: ASTM C 31; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
f. Compressive-Strength Tests: ASTM C 39; test one specimen at seven days and two specimens at 28 days.
    1) A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.
g. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
h. Test results shall be reported in writing to Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
i. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer.
j. Concrete will be considered defective if it does not pass tests and inspections.
k. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
l. Prepare test and inspection reports.

I. DEFECTIVE WORK

Damaged or defective concrete shall be repaired or removed and replaced immediately as directed by the Engineer. Examples of defective work include but are not limited to:

1. Work built outside tolerances
2. Concrete of inadequate strength
3. Concrete having surface conditions indicating poor durability such as crazing, crumbling, or “map cracking”
4. Minor faults such as small “honeycomb” areas and voids

The Engineer shall be notified immediately when such conditions become apparent. Repairs shall be as directed by the Engineer.

END OF SECTION 03 3000

SECTION 03 4100 – PRESTRESSED CONCRETE MEMBERS FOR BRIDGES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Related Sections:

1. Standard Specifications: MoDOT Standard Specifications, 2024
   a. NOTE: Method of Measurement or Basis of Payment included in Standard Specifications do NOT apply.
   b. https://www.modot.org/missouri-standard-specifications-highway-construction

1.3 REFERENCES

A. Missouri Standard Specifications for Highway Construction, Sections 705, 1029, 1036 (https://www.modot.org/missouri-standard-specifications-highway-construction).

1.4 SUBMITTALS

A. Documentation:
1. Shop drawings shall be submitted to the engineer for approval. Prior to making shop drawings, the contractor shall submit in writing for approval of the engineer any proposed tack welding in lieu of tying of the reinforcing bars of prestressed members. No heat or welding will be permitted in the proximity of prestressing tendons in the members.
2. Shop drawings shall show in detail the type, size, number of units, location of tendons, enclosures, application of bond breaker, approved locations of tack welding of reinforcing bars, method and sequence of releasing the strands, anchorage details, and details of proposed lifting loops and lifting procedure. Shop drawings for adjacent beams shall show the holes for the tie rods, aligned in such a way as to prevent damage to the precast units during the placement of the precast units on the beam caps and the installation and tensioning of the tie rods through the precast units.
3. Shop drawings shall show a tabulation of the design computations and the total prestress force, size and spacing of all reinforcing steel and concrete compressive strengths for strand release and design.

PART 2 - PRODUCTS

2.1 PRESTRESSED CONCRETE MEMBERS

A. Shall be in accordance with section 1029 of the MoDOT Standard Specifications.

2.2 REINFORCING STEEL FOR CONCRETE STRUCTURES

A. Shall be in accordance with section 1036 of the MoDOT Standard Specifications.

PART 3 - EXECUTION

3.1 ERECTION

A. Erection of the structure shall be in accordance with the working drawings. Camber of beams, measured as the differential between adjacent beams in the final location, shall be no more than 1/8 inch per 10 feet of span, and in no case greater than 1 inch. The butt joints between precast panels shall be caulked to prevent excessive grout leakage between panels.

END OF SECTION 034100

SECTION 03 4116 – PRECAST CONCRETE SLABS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. SECTION 03 6000 – GROUT

C. SECTION 03 2100 – REINFORCEMENT BARS

D. SECTION 03 3000 – CAST-IN-PLACE CONCRETE

E. Standard Specifications: MoDOT Standard Specifications, 2024

1. Note: Method of Measurement or Basis of Payment included in Standard Specifications do NOT apply.

2. https://www.modot.org/missouri-standard-specifications-highway-construction

1.2 SUMMARY

A. Precast concrete slabs will be installed for the new bridge decking.

B. Bedding material and adhesive to go between the precast concrete panels and existing bridge structure.

1.3 SUBMITTALS

A. The Contractor shall provide the Engineer and Owner product data, testing results, and shop drawings for precast concrete panels and related components.

B. Product data for adhesive and expanded or extruded polystyrene materials (bedding material)

PART 2 - PRODUCTS

2.1 Precast concrete slabs shall have a minimum compressive strength of 6,000 psi and shall comply with all requirements for MoDOT Type A-1 Concrete Mix.

2.2 Reinforcing Bars shall be Grade 60 epoxy coated steel bars.

2.3 Steel plates shall be embedded in the precast concrete slabs by the manufacturer and shall comply with Specification 05 1233 – Structural Steel. See plans for location.

2.4 All connections shall be in compliance with Specification 05 1233 – Structural Steel.

2.5 Bedding material for precast concrete slabs shall be expanded or extruded polystyrene material in accordance with:

Property	Test	Requirement
Compression Strength	ASTM D 1621	60 psi, min.
Water Absorption	ASTM D 2842	2% by volume, max.
Oxygen Index	ASTM D 2863	24 minimum

2.6 Adhesive for use with expanded or extruded polystyrene material shall be in accordance with the polystyrene manufacturer's recommendations.

PART 3 - EXECUTION

3.1 See plans for placement of precast concrete slabs. Grout or use joint filler as directed by the plans and in compliance with applicable specifications.

3.2 Details for use of equipment are included on the Plans.

3.3 The bedding material shall be glued using adhesive to the girders and stringers and the precast concrete panels.

3.4 The thickness of the bedding material shall be adjusted as required to achieve a level plane across the tops of the girders and stringers.

END OF SECTION 03 4116

SECTION 03 6000 – GROUT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Grout

B. Related Sections:

1. Division 03: Precast Concrete Slabs

2. Standard Specifications: MoDOT Standard Specifications, 2023
   a. NOTE: Method of Measurement or Basis of Payment included in Standard Specifications do NOT apply.
   b. https://www.modot.org/missouri-standard-specifications-highway-construction

1.3 REFERENCES

A. Missouri Standard Specifications for Highway Construction, Sections 1019, 1066. (https://www.modot.org/missouri-standard-specifications-highway-construction).

1.4 SUBMITTALS

A. Documentation:

1. Manufacturers product data for Type 1 Portland cement

PART 2 - PRODUCTS

2.1 MORTAR

A. Mortar used for grout shall consist of one part Type 1 Portland cement and three parts sand, by volume, mixed with sufficient water to form a grout of proper consistency.

2.2 SAND

A. Sand shall be clean and in accordance with MoDOT Standard Specifications for Highway Construction, Section 1005.

PART 3 - EXECUTION

3.1 APPLICATION

A. Mortar and grout shall be mixed in small quantities as needed and shall not be retempered or used after setting has begun.

B. Cleaning and surface preparation shall include the removal of all loose and delaminated concrete as well as any other contaminates or latent materials to the satisfaction of the owner/engineer.

C. All surfaces shall be cleaned and prepared to the approved manufacturer's recommendations.

END OF SECTION 036000

SECTION 05 5200- METAL RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Metal Handrail

2. Protective Coating

B. Related Sections:

1.3 PERFORMANCE REQUIREMENTS

A. Performance: The work under this item shall consist of providing and installing steel handrail to provide a complete and properly functioning fence system at the locations as indicated in the Drawings.

1.4 SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components, profiles, and descriptions of finishes.

B. Shop Drawings: Detailed shop drawings of the handrail shall be submitted to the engineer for review and approval prior to beginning fabrication. Shop drawings shall indicate component dimensions, sizes, details, materials, finishes, connection and joining methods, expansion joints, embedment installation details and the relationship to adjoining work. All materials shall meet the requirements of Sec 106.9 of the current version of the Missouri Standards and Specifications for Highway Construction. Manufacturer's installation instructions shall be submitted for the fence mounting method shown in the shop drawings.

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify layout information for handrail shown on Drawings in relation to existing or proposed structures or other conflicts. Verify dimensions by field measurements.

PART 2 - PRODUCTS

2.1 METAL HANDRAIL

A. General: Provide metal, free from surface blemishes where exposed to view in the finished unit. Exposed-to-view surfaces exhibiting pitting, seam marks, roller marks, stains, discolorations, or other imperfections on finished units are not acceptable.

B. Post and frame:

1. Posts shall be spaced per the approved shop drawings, plus or minus ½". For installations along sloping grades, the post spacing will be measured along the grade.

2. Posts shall have one draft hole near base of pole. Hole shall be drilled into the post, during the fabrication process and prior to application of any coatings. Draft hole will be 3/8" diameter and immediately above the mounting plate or the finished concrete.

C. Concrete:

1. Concrete for post footings shall have a minimum 28-day compressive strength of 4,000 psi.

D. Hardware:

1. Nuts, bolts, washers or other required hardware shall be either stainless steel or galvanized. Galvanized hardware shall be in accordance with ASTM 153

E. Protective Coating:

1. The handrail panels and posts, etc. shall be hot-dip galvanized in accordance with ASTM A123 and the manufacturer' recommendations. Any construction or installation activities that scratch or remove the galvanized coating shall be repaired per the manufacturer's instructions and at the expense of the contractor.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.

1. Do not begin installation before final grading is completed unless otherwise permitted by engineer.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 HANDRAIL INSTALLATION

A. Posts: Posts shall be set plumb in concrete footings. Minimum footing depth shall be 18 in. Top of concrete footing to be crowned to shed water away from the post.

B. Install handrail to be free of excessive deflection, distortion, nonalignment, misplacement, or malfunction.

3.3 WARRANTY

A. All handrail components and finishes shall be warranted by the manufacturer for a period of 10 years from the date of final acceptance by the engineer. Warranty shall cover any defects in material finish, including cracking, peeling, chipping, blistering, or corrosion and necessary labor required to replace or restore such parts.

END OF SECTION 05 5200

SECTION 07 9200 –JOINT SEALANT

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 03 – Section 03 3000 Cast-in-Place Concrete

C. Division 03 – Section 03 4116 Precast Concrete Slabs

D. Division 32 – Section 32 1313 Concrete Paving

E. Standard Specifications: MoDOT Standard Specifications, 2023;
   a. NOTE: Method of Measurement or Basis of Payment included in Standard Specifications do NOT apply.
   b. https://www.modot.org/missouri-standard-specifications-highway-construction

1.2 SUMMARY

A. This section provides requirements on joint sealant and backer rod to be used for joints as noted in the plans.

1.3 ALTERNATES

A. The contractor may propose alternate joint sealants and backer rods. All submittals must be in accordance with Sec 013300. Engineer and owner must receive requests for alternate joint sealer at least two weeks before start of construction. Engineer and owner will determine approval of alternate joint sealants.

1.4 SUBMITTALS

A. Product Data for the joint sealant and backer rod.

PART 2 - PRODUCTS

2.1 JOINT SEALANT

A. The silicone expansion joint sealant shall be a rapid cure, self-leveling, cold applied, single or two-component silicone sealant. The Sealant shall demonstrate excellent resilience, flexibility, and resistant to moisture and puncture upon curing. The sealant shall demonstrate excellent adhesion to Portland Cement concrete, polymer concrete and steel over a range of -30 to 130 degrees Fahrenheit while maintaining a watertight seal.

B. The sealant shall not contain any solvents or diluents that cause shrinkage or expansion during curing. Do not use acid-cure sealants.

C. The date of manufacture or “use by” date shall be provided with each lot of sealant or primer. Material 12 months old or older from the date of manufacture or past the “use by” date shall not be used.

D. Backer rod and silicone expansion joint sealant material components must meet ASTM D 1475 standards for Specific Gravity, ASTM C 1183 standards for Extrusion Rate, ASTM D 2240 standards for Durometer Hardness Shore and ASTM C 793 standards for Ozone and UV Resistance. After mixing the material it must meet ASTM C 679 standards for Tack-Free Time and have self-leveling flow. Upon completion, the material must meet ASTM D 5329 standards for Joint Elongation and Joint Modulus.

Physical Properties:	Requirement
Each component as supplied:	
Specific Gravity (ASTM D 1475)	1.2 - 1.4
Extrusion Rate (ASTM C 1183)	200 - 550 g/minute
Durometer Hardness, Shore (ASTM D 2240) "00" (0 C and 25 C ± 1 C [77 ± 3 F])	30 - 60
Ozone and U.V. Resistance (ASTM C 793)	No chalking, cracking or bond loss after 5000 hrs.
After Mixing:	
Flow	Self-Leveling
Tack-Free Time (ASTM C 679)	60 minutes maximum
Upon Complete Cure: (ASTM D 5329[a])	
Joint Elongation (Adhesion to concrete/ steel/polymer concrete)	600% minimum
Joint Modulus (at 100% elongation)	3-12 psi

[a]Modified; Sample cured two days at 77 ± 2 F and 50 ± 5 percent relative humidity.

2.2 BACKER ROD

A. Backer rod shall be a semi-rigid closed-cell, expanded polyethylene foam.

PART 3 - EXECUTION

3.1 JOINT INSTALLATION

A. Concrete will be fully cured and allowed to dry for a minimum of 7 days. All joints will be cleaned of gravel and loose material. Areas to be in contact with the sealant shall be sand blasted with a clean, hard aggregate that will leave little to no dust residue.

B. Surfaces to receive sealant will be primed immediately following sand blasting. Air and substrate temperatures must be at least 40 degrees Fahrenheit when applying primer and silicone sealants.

C. Backer rod and primers should be used based on manufacturers recommendations. Sand blasting, priming and sealing shall be performed on the same day.

D. Sealant shall only be applied when substrate temperatures are above 40 degrees Fahrenheit and below 90 degrees Fahrenheit and 5 degrees Fahrenheit above the dew point.

END OF SECTION 079200

SECTION 09 9656 – EPOXY COATINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Surface Preparation and Epoxy Sealing at concrete bents and piers

B. Related Sections:

1. Standard Specifications: MoDOT Standard Specifications, 2023
   a. NOTE: Method of Measurement or Basis of Payment included in Standard Specifications do NOT apply.
   b. https://www.modot.org/missouri-standard-specifications-highway-construction

1.3 REFERENCES

A. Missouri Standard Specifications for Highway Construction, Sections 711, 1059. (https://www.modot.org/missouri-standard-specifications-highway-construction).

1.4 SUBMITTALS

A. Documentation:

1. Manufacturers product data and testing results of epoxy sealant. Testing results must be provided showing results after 1000 hours of exposure in an accelerated weathering device. The tests shall be in accordance with ASTM D 822 or ASTM G 154 using test cycle No. 2 defined in ASTM 822, except that during the six-hour period of darkness, the relative humidity of the air shall be 95± 4%. If ASTM G 154 QUV exposure testing is used, Type A lamps shall be used.

PART 2 - PRODUCTS

2.1 SEALANT

A. The area shall be sealed with a qualified Type III epoxy or epoxy material for the polymer wearing surface.

2.2 EPOXY COATING

A. This protective coating shall consist of a two-component, modified polyamide converted epoxy, clear or gray in color.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION

A. The surface shall be thoroughly cleaned of all vegetation, loose material, dirt, mud, and other objectionable material immediately prior to application of epoxy protective coating.

B. Cleaning and surface preparation shall include the removal of all loose and delaminated concrete as well as any other contaminates or latent materials to the satisfaction of the owner/engineer.

C. All surfaces shall be cleaned and prepared to the approved manufacturer's recommendations.

3.2 PROTECTIVE COATING - EPOXY

A. New concrete shall cure a minimum of 28 days prior to application of the protective coating.

B. The coating shall be applied to dry surfaces. The surface preparation and application shall be in accordance with the manufacturer's recommendations. The coating shall be applied to obtain a minimum dry film thickness of 6 mils.

END OF SECTION 09 9656

SECTION 10 1453- TRAFFIC SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Signage for State Highway

2. Signage for Pedestrian Trail

B. Related Sections:

1. Standard Specifications: MoDOT Standard Specifications, 2024 NOTE: Method of Measurement or Basis of Payment included in Standard Specifications do NOT apply.

1.3 PERFORMANCE REQUIREMENTS

A. Performance: Signs to be placed for use on State Highways or which are otherwise intended for use by motorized vehicles, shall conform to the requirements of Section 1042 of the current version of the Missouri Standard Specifications for Highway Construction.

B. Signs to be placed in areas intended only for non-motorized vehicles shall likewise be in accordance with Section 1042 with the exception that retroreflective elements or any associated subcomponents need not be used.

1.4 SUBMITTALS

A. Product Data: The manufacturer shall make available, upon request, NTPEP test results from all test decks, and certification showing that the reflective material is in accordance with ASTM D 4956 specifications, as required.

B. Required paperwork shall include a certification statement indicating signs meet all applicable requirements herein to include aluminum standard and extruded panel, reflective sheeting (manufacturer, series and color), and hardware certifications. Material quantities, such as square foot of flat sheet, reflective sheeting and a shipping list of all signs shall be included in the certification packet.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Signs shall be packaged and shipped according to the reflective sheeting manufacturer's recommendations, as required.

B. All signs shall include decals indicating sign production date, lot number of reflective sheeting used in the production of sign and other information necessary for proper sign fabrication.

C. Signs delivered for use on a project shall be stored in a manner meeting the approval of the engineer. Any sign damaged, discolored or defaced during transportation, storage or erection may be rejected.

PART 2 - PRODUCTS

2.1 SIGN MATERIAL

A. General: Sign material shall be of new stock and shall be in accordance with Section 1042 of the current version of the Missouri Standard Specifications for Highway Construction.

B. Sign Thickness for flat sheet signs shall be as follows:

1. For signs with an area of 9 square feet or less - 0.080 inches

2. For signs with an area between 9 and 16 square feet – 0.100 inches

3. For signs larger than 16 square feet – 0.125 inches

C. Flat sheet signs shall not have holes except those drilled or punched for proper mounting. For locations of required holes see Standard Plans for the Missouri Department of Transportation 903.02AP located at the following web address: https://www.modot.org/sites/default/files/documents/90302_3.pdf

D. Mounting Requirements:

1. Signposts, foundations, and mountings shall be so constructed as to hold signs in a proper and permanent position, and to resist swaying in the wind or displacement by vandalism.

2. Plastic/nylon washers shall be used between the heads of all twist fasteners (such as screws, bolts or nuts) and the sign sheeting to protect the sheeting from the twisting action of the bolt heads.

PART 3 - EXECUTION

3.1 FOOTINGS

A. Footings for signs on pipe posts shall be in accordance with Section 903.3.1 of the current version of the Missouri Standard Specifications for Highway Construction. For footing dimensions and related details see Standard Plans for the Missouri Department of

Transportation 903.03BQ located at the following web address:
https://www.modot.org/sites/default/files/documents/90303_8.pdf

B. Wood posts shall have the maximum of ¼ of the total final post length but no less than 30”driven into the ground in order to provide a stable foundation.

3.2 POSTS

A. General:

1. The contractor shall be responsible for determining post lengths to provide the clearances as shown on the drawings. Field cutting of posts will be permitted.

2. Sign posts shall be vertical. Any posts bent or otherwise damaged to the extent that the post is considered unfit for use shall be removed and replaced with an acceptable post at the contractor’s expense.

3. Galvanized and aluminum material shall be handled so as to avoid damage to the surfaces. Any material on which the galvanizing has been bruised or broken will be rejected or may, with approval from the engineer, be repaired in accordance with Section 1081 of the current version of the Missouri Standard Specifications for Highway Construction.

B. Signage for Trail:

1. Posts for signs adjacent to the pedestrian trail shall be pressure treated wood posts placed based on the dimensions and locations shown in the drawings.

END OF SECTION 10 1453

SECTION 31 1100- CLEARING AND GRUBBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Clearing and Grubbing

2. Trees Designated to Remain

3. Disposals

B. Related Sections:

1. Division 02: Section 02 4100 Demolition.

2. Division 01: Section 01 5713 Temporary Erosion Control Program

1.3 PERFORMANCE REQUIREMENTS

A. Description: This work shall consist of clearing, grubbing, removing and disposing of items, debris and other objectionable matter from within the project work limits and any easement areas, except vegetation, in particular any trees designated “do not disturb”, which are to remain or be selectively treated.

B. Clearing and grubbing shall include removal of all trees, stumps, roots and any objectionable matter resting on or protruding through the surface of the original ground, except for those items designated to remain.

C. All trees to be removed must be cut between November 1st and March 31st. Clearing and stump removal may occur at any point within the contracted period of time.

1.4 PROJECT CONDITIONS

A. General: The owner will designate all trees, shrubs, plants and other objects that are to remain. All designated items shall be preserved. Any damage to natural terrain, vegetation or objects designated to remain shall be repaired or replaced, as determined by the engineer, at the contractor’s expense. Contractor shall verify that the work can be completed without disturbing the remaining items before beginning any work on the project.

PART 2 - PRODUCTS - (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.

3.2 PREPARATION

A. Confirm all tree removals with engineer or field representative before proceeding. Furthermore, contractor shall verify that all employees of the contractor including any and all subcontractors are well aware of the number and locations of the trees designated to remain. Flag the limits of tree clearing and coordinate field verification with owner or representative prior to any removal.

B. Protect and maintain benchmarks and survey control points from disturbance during construction.

3.3 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion and sedimentation-control Drawings and requirements of Owner.

B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.4 CLEARING AND GRUBBING

A. Clearing Limits: Limits of clearing shall be kept as close as possible to the grading limits as shown on the plans to preserve as many trees as possible. All clearing activities are subject to the approval of the engineer.

B. Grubbing Limits: Within the limits of the cut areas, grubbing shall be performed to a minimum depth of 18 inches below the finished grade of roadways, ditches, channels, borrows and structures. The areas below the natural ground surface shall be grubbed to a depth necessary to remove all stumps, roots, buried logs and other objectionable material. Except in areas to be excavated, holes created by removals shall be backfilled with suitable material and compacted to the approximate density of the adjacent area.

C. Selective Clearing and Grubbing: Low hanging, unsound or unsightly branches on trees or shrubs designated to remain shall be removed as directed by the engineer.

3.5 DAMAGES

A. Compensation to the owner for damages to trees, vegetation, or other items designated to remain shall be determined based on the size or importance of said item.

3.6 DISPOSALS

A. The Contractor shall legally dispose of all trees, stumps, brush, roots, and all other objectionable matter removed in the clearing and grubbing process from the project site.

END OF SECTION 31 1100

SECTION 31 2300 – EXCAVATION AND FILL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Preparing subgrades for walks, pavements and grasses.

2. Subsurface drainage backfill for walls and trenches.

3. Excavating and backfilling trenches for utilities.

B. Related Sections:

1. Division 01: Section 01 5713 "Temporary Erosion and Sediment Control" for temporary controls, utilities, and support facilities; also for temporary site fencing if not in another Section.

2. Division 03: Section 03 3000 "Cast-in-Place Concrete" for granular course if placed over vapor retarder and beneath the slab-on-grade.

3. Division 31: Section 31 2313 “Subgrade Preparation”

4. Division 32: Section 32 1123 “Aggregate Base Courses”

5. Division 32: Section 32 9200 "Turf and Grasses" for finish grading in turf and grass areas, including preparing and placing planting soil for turf areas.

6. Standard Specifications: MoDOT Standard Specifications, 2024 NOTE: Method of Measurement or Basis of Payment included in Standard Specifications do NOT apply.

1.3 DEFINITIONS

A. Backfill: Soil material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

C. Borrow Soil: Satisfactory soil imported from designated stockpile area for use as fill or backfill.

D. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

E. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

F. Fill: Soil materials used to raise existing grades.

G. Structures: Bridges, box culverts, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

H. Subbase Course: Aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or aggregate surface pavement.

I. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

J. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 SUBMITTALS

A. Product Data: For each type of the following manufactured products required:

1. Geotextiles.

B. Samples for Verification: For the following products, in sizes indicated below:

1. Geotextile: 12 by 12 inches.

C. Qualification Data: For qualified testing agency.

D. Test Report:

1. Laboratory compaction test and index property test results for each material used on site shall be submitted to the Engineer prior to placement. Any work by Contractor prior to test submittals and subsequent Engineer review and approval shall be work done at the Contractor’s risk.

2. In-Place Density/ Moisture tests shall be taken at the frequency of 4 per day per spread, with a minimum of one test per lift.

3. Test reports shall be submitted to the Engineer daily. The reports shall clearly indicate the location of all tests. The reports shall include the results of all tests (pass or fail) and all re-tests.

E. Pre-excavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

1.5 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by Engineer.

C. Utility Locator Service: Notify Missouri One Call System, Inc. 1-800-344-7483 for area where Project is located before beginning earth moving operations.

D. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures, specified in Division 01 Section “Temporary Erosion and Sediment Controls” and Division 31 Section "Erosion and Sedimentation Controls” are in place.

E. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

F. Do not direct vehicle or equipment exhaust towards protection zones.

G. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials from designated stockpile area when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soil Classification Groups A-1, A-2-4, A-2-5, and A-3 according to AASHTO M 145, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: Soil Classification Groups A-2-6, A-2-7, A-4, A-5, A-6, and A-7 according to AASHTO M 145, or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Subgrade Stabilization: The contractor shall remove oversize material if the upper 4 inches of the subgrade, as tentatively completed, contains loose rock over 2 inches in size to make the subgrade unacceptable for the proposed type of surfacing in the judgment of the engineer. The upper 18 inches of the earth subgrade extending the full width of the project, shall be compacted to at least 95 percent of maximum Standard Proctor density. The subgrade material shall not be dumped in place but shall be distributed by blading or dozing in a manner to ensure proper placement in final position. See Section 31 2313.

E. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

F. Aggregate Base Course: Shall comply with sections 1007 & 304 of the MoDOT Specifications for Highway Construction where called out as “Type 5 Aggregate base on the typical sections of the plans. Where 2” minus is called out on the typical sections, placement of the base shall comply with section 304 of the MoDOT Specifications for Highway Construction and the material shall be equivalent to that of 2” rolled stone base.

G. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

H. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve. Bedding course for box culverts shall be according to MoDOT Specifications for Highway Construction sections 733 & 1007 for Type I aggregate.

I. Drainage Course: 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.

J. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch sieve and 0 to 5 percent passing a No. 4 sieve.

K. Sand: ASTM C 33; fine aggregate.

L. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

M. Geotextile Fabric for Subsurface Drainage: Fabric used as a filter to prevent drainage media from clogging with fines from adjacent soil. Fabric used to line drainage trenches and wrap drain pipes. The minimum permittivity shall be 1.0 sec-1. The material class shall be AASHTO M288 Class 2.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

B. Protect and maintain erosion and sedimentation controls during earth moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

A. Items in this section shall be in accordance with section 203 of the MoDOT Specifications for Highway Construction.

B. Class A Excavation: Class A Excavation will consist of all roadway and drainage excavation not classified as Class C, Unclassified or any other designated excavation. No changes in the Contract Sum or the Contract Time will be authorized for removal of obstructions.

1. If excavated materials, intended for fill and backfill, include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

C. Class C Excavation: Class C Excavation will consist of the removal of stone, including sandstone or igneous formations, in ledges 6 inches thick or more. Boulders or other detached stones, each having a volume of 2 1/2 cubic yards or more, will likewise be considered Class C Excavation.

1. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:

a. 6 inches outside of minimum required dimensions of concrete cast against grade.

b. 6 inches beneath bottom of concrete slabs-on-grade.

c. 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide.

D. Class 4 Excavation: Class 4 Excavation will consist of excavation for box culverts, small retaining walls and other miscellaneous structures.

1. Class 4 excavation will be measured to the nearest cubic yard for each structure of that volume of material actually removed from within the area bounded by vertical planes 18 inches outside of the outer wall of the box culvert with bottom slabs.

2. Final measurement of Class 4 Excavation for box culverts not classified as bridges, small retaining walls and miscellaneous structures will not be made unless there is an authorized change from plan location resulting in a different quantity or there is an authorized change averaging more than 6 inches in the foundation elevation. If a revision is made or an appreciable error is found in the contract quantity, the revision or correction will be computed and added to or deducted from the contract quantity. Excavation classification will not change if a substitution of a drainage structure type is approved.

E. After removal of the roadway excavation material to the required section, all material within the top 6 inches of the subgrade shall be proof rolled.

3.5 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.6 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: 12 inches each side of pipe or conduit

C. Trench Bottoms: Excavate trenches 4 inches deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.

1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

3.7 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.8 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, damp proofing, waterproofing, and perimeter insulation.
2. Testing and inspecting underground utilities.
3. Removing concrete formwork.
4. Removing trash and debris.
5. Removing temporary shoring and bracing, and sheeting.
6. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.9 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Backfill voids with satisfactory soil while removing shoring and bracing.

D. Place and compact initial backfill of subbase material free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.

1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

E. Place and compact final backfill of satisfactory soil to final subgrade elevation.

F. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.10 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use satisfactory soil material.

C. Place soil fill on subgrades free of mud, frost, snow, or ice.

D. Prior to placing fill or embankment, the surface of the existing ground shall be prepared as specified herein, moistened as required, and the top 6 inches compacted. Before placing any fill in areas under pavement and walks, scarify minimum 6 inches and re-compact. Thee fill must be proof rolled for acceptance. Any unsuitable areas need to be addressed via 312313 “Subgrade Preparation”.

E. The existing surface upon which embankment material is to be placed shall have all unstable and unsuitable material removed before starting the embankment work.

F. Earth shall be placed in successive horizontal layers distributed uniformly over the full width of the embankment area. Each layer of material shall not exceed 8 inches maximum in thickness (loose state) and shall be compacted to not less than the required density before the next layer is placed thereon.

3.11 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.12 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:

1. Under pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
2. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 85 percent.

3.13 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Rough Grading: Slope grades to direct water away from pavements and walks and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch
2. Walks or Pavements: Plus or minus 1 inch

3.14 SUBSURFACE DRAINAGE

A. Subdrainage Pipe: Specified in Division 33 Section "Pipe Culverts."

B. Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a 6-inch course of filter material on subsurface drainage geotextile to support subdrainage pipe. Encase subdrainage pipe in a minimum of 12 inches of filter material, placed in compacted layers 6 inches thick, and wrap in subsurface drainage geotextile, overlapping sides and ends at least 6 inches.

1. Compact each filter material layer with a minimum of two passes of a plate-type vibratory compactor.

C. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches of final subgrade, in compacted layers 6 inches thick. Overlay drainage backfill with one layer of subsurface drainage geotextile, overlapping sides and ends at least 6 inches.

1. Compact each filter material layer with a minimum of two passes of a plate-type vibratory compactor.
2. Place and compact impervious fill over drainage backfill in 6-inch-thick compacted layers to final subgrade.

3.15 SUBGRADE UNDER PAVEMENTS AND WALKS

A. Subgrade shall be substantially uniform in density throughout the entire width of the subgrade. The subgrade shall be constructed to drain surface water to the side ditches and all ditches shall be kept open by the contractor. All subgrade shall be rolled. The subgrades shall be checked after rolling and, if not at the proper elevation at all points, sufficient material shall be removed or added and compacted to bring all portions of the subgrade to the required elevation and density. Subgrade shall comply with Division 31 Section 2300 Excavation and Fill.

B. Proof Rolling

1. Once the subgrade has been brought to the final plan elevation, but prior to the approval of the subgrade for paving, the area should be roll tested the entire length. The subgrade will not be acceptable if rutting, pumping, or deformation of the subgrade results from the roll test. This testing will be done by the contractor and will be in addition to the applicable moisture and density testing.
2. Equipment for roll testing shall be a tandem dump truck (one front and two rear axles) carrying a maximum load of twenty (20) tons.
3. The truck shall proceed slowly along each traveled path, allowing the Engineer/Owner/Testing Agency to walk alongside and observe the results. Areas failing the roll test will be reworked and retested prior to approval of the subgrade for paving.

C. The subgrade shall be compacted and brought to true shape.

3.16 FIELD QUALITY CONTROL

A. Third Party inspector working under contract with the general contractor will perform the following inspections:

1. Soil fill compaction, conduct a minimum of 1 density test per 1,000 square yards, after compaction, for each active grading spread regardless of final surface material
2. Subgrade: conduct proof rolling visual verification.

3.17 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specify tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and re-compact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.18 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or as directed by Engineer.

1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 31 2300

SECTION 31 2313- SUBGRADE PREPARATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Rock Subgrade Stabilization

B. Related Sections:

1. Division 31: Excavation and Fill.

2. Division 32: Aggregate Base Courses.

1.3 PERFORMANCE REQUIREMENTS

A. Description: This work shall consist of removing existing material and replacing it with a shot rock to improve stability.

B. This work will only be completed if subgrade stabilization located in Section 31 2300 is not achievable.

C. 6” Aggregate Base will be placed on top of the Rock Subbase in accordance with Section 32 1123.

PART 2 - PRODUCTS

2.1 MATERIAL

A. The material source for rock stabilization shall be durable stone or broken concrete containing a combined total of no more than 10 percent, by weight, of earth, sand, shale and non-durable rock. Material from geologic-filled sink deposits or stone indicating evidence of solution activity shall not be used.

B. No particle dimension shall exceed 6 inches. The material shall be uniformly graded from coarse to fine. Broken, sound concrete pavement and composite pavements may be used provided the ratio of the longest dimension measurement to thickness does not exceed 2:1 and provided there is no excessive exterior steel mesh that would affect compaction. Milled, crushed, or chunked forms of bituminous pavement shall not be used. Small, thin amounts adhering to broken concrete pavement will be permitted.

PART 3 - EXECUTION

3.1 APPLICATION

A. Subgrade stabilization shall be done to all areas uniformly and laterally between outside shoulder points plus 12 inches on each side.

B. Subgrade stabilization shall be done to all areas uniformly where the soil cannot be stabilized adequately for the placement of aggregate base according to Section 32 1123.

C. The 6" Shot rock shall be placed as the fill material. The material shall not be dumped in place, but shall be distributed by blading or dozing in a manner to ensure proper placement in final position in the subgrade. Material for 18-inch rock base may be placed in one lift. Material shall be compacted to the final thickness required to achieve grades and elevations found in the drawings.

D. The final surface of the shot rock subbase shall be of a uniform texture and grade suitable for the application of an additional 6" of Aggregate Base in accordance with Section 32 1123. The top 2 inches of rock base shall consist of either 2-inch maximum rock fragments, spalls, reclaimed asphalt, or concrete. The 2-inch maximum size granular material shall have a plasticity index not to exceed 10 and a gradation such that at least 50 percent of the material will be retained on the No. 4 sieve.

E. Subgrade stabilization is not anticipated to be required for this work. If it becomes necessary, the contractor will notify the owner and engineer at least 24 hours before commencement of soil removal or shot rock placement.

3.2 COMPACTION

A. 6" Shot Rock Subgrade

1. The compactive effort on each layer shall consist of distributing all equipment movements over the entire embankment area and of at least three complete passes with a tamping-type roller over the entire area to be compacted. The tamping-type-roller shall have tampers or feet projecting no less than 6 inches from the surface of the drum and shall have a minimum load on each tamper of 250 psi of tamping area. Compactive efforts shall be continues, if necessary, until the tamping feet penetrate no more than 2 inches into the layer of material being compacted. Continuous leveling and manipulating will be required during compacting operations and the moisture content shall be adjusted as necessary to permit proper consolidation. Dumping and rolling area shall be kept separate, and no lift shall be

covered by another until compaction complying with these requirements has been attained. Unstable areas in the embankment shall be removed and replaced with suitable material at the contractor's expense. Each layer of embankment constructed of rock or rocky material shall also be compacted y three complete passes of the tamping-type roller. If compaction of embankment is not designated by the contract, compaction will not be required other than that attained by distributing equipment movements over the entire embankment area.

END OF SECTION 31 2313

SECTION 31 2500- EROSION AND SEDIMENTATION CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Erosion Control Blanket
2. Turf Reinforcement Mat

B. Related Sections:

1. Division 01 – Section 01 5723 Storm Water Runoff Control Program
2. Division 01 – Section 01 5713 Temporary Erosion and Sediment Control
3. Division 31 – Section 31 3716.13 Rubble-Stone Riprap
4. Division 32 – Section 32 9200 Turf and Grasses

1.3 DEFINITIONS

A. Minimum Average Roll Value (MARV): Property value calculated as typical minus two standard deviations. Statistically, it yields a 97.7 percent degree of confidence that any sample taken during quality assurance testing will exceed value reported.

B. Typical Roll Value: Property value calculated from average or mean obtained from test data.

C. Rolled Erosion Control Product (RECP) – A temporary degradable or long-term non-degradable material manufactured or fabricated into rolls designed to reduce soil erosion and assist in the growth, establishment and protection of vegetation.

D. Turf Reinforcement Mat (TRM) – A long-term, non-degradable RECP composed of UV-stabilized, non-degradable, synthetic fibers, nettings and/or filaments processed into three-dimensional reinforcement matrices designed for permanent and critical hydraulic applications where design discharges exert velocities and shear stresses that exceed the limits of mature natural vegetation. TRMs provide sufficient thickness, strength and void space to permit soil filling and/or retention and the development of vegetation within the matrix.

E. Erosion Control Blanket (ECB) – A temporary, degradable RECP composed of processed natural or synthetic fibers which are either mechanically, structurally or chemically bound together to form a continuous matrix.

1.4 SUBMITTALS

A. Submittals shall be in accordance with Section 01 3300:

1. Certifications:

a) The Contractor shall provide the Engineer a certificate stating the name of the RECP manufacturer, product name, style, chemical compositions of filaments or yarns and other pertinent information to fully describe the geotextile.

b) The Manufacturer is responsible for establishing and maintaining a quality control program to assure compliance with the requirements of the specification. Documentation describing the quality control program shall be made available upon request.

c) The manufacturer's certificate shall state that the furnished RECP meets MARV requirements of the specification as evaluated under the manufacturer's quality control program. The certificate shall be attested to by a person having legal authority to bind the Manufacturer.

2. Manufacturing Quality Control (MQC) test results shall be provided upon request.

3. Independent Performance Test Results shall be provided upon request.

1.5 DELIVERY, STORAGE, AND HANDLING

A. RECP labeling, shipment and storage shall follow ASTM D 4873.

B. Product labels shall clearly show the manufacturer or supplier name, style name, and roll number.

C. Each shipping document shall include a notation certifying that the material is in accordance with the manufacturer's certificate.

D. Each RECP roll shall be wrapped with a material that will protect the geotextile from damage due to shipment, water, sunlight, and contaminants.

E. The protective wrapping shall be maintained during periods of shipment and storage.

F. During storage, RECP rolls shall be elevated off the ground and adequately covered to protect them from the following: Site construction damage, extended exposure to ultraviolet (UV) radiation, precipitation, chemicals that are strong acids or strong bases, flames, sparks, temperatures in excess of 160 °F (71 °C) and any other environmental condition that might damage the RECP.

1.6 QUALITY ASSURANCE SAMPLING, TESTING, AND ACCEPTANCE

A. RECP shall be subject to sampling and testing to verify conformance with this specification. Sampling for testing shall be in accordance with ASTM D 4354.

B. Acceptance shall be in accordance with ASTM D 4759 based on testing of either conformance samples obtained using Procedure A of ASTM D 4354, or based on manufacturer's certifications and testing of quality control samples obtained using Procedure B of ASTM D 4354.

PART 2 - PRODUCTS

2.1 EROSION CONTROL BLANKETS

A. Type I RECP:

Table of Typical Values for use on 3H:1V and flatter slopes where vegetation is expected to be fully established in 12 months or less:			
Property	**Test Method**	**Units**	**Property Requirement**
Thickness	ASTM D-6525	in (mm)	0.25 (6.4)
Tensile Strength	ASTM D-6818	lbs/ft (kN/m)	75 x 75 (1.0 x 1.0)
Tensile Elongation	ASTM D-6818	%	25

B. Type II RECP:

Typical Values for use on 2.5H:1V and flatter slopes where vegetation is expected to be fully established in 1-2 years:			
Property	**Test Method**	**Units**	**Property Requirement**
Thickness	ASTM D-6525	in (mm)	0.40 (10.16)
Tensile Strength	ASTM D-6818	lbs/ft (kN/m)	100 x 100 (1.5 x 1.5)
Tensile Elongation	ASTM D-6818	%	30

C. Type III RECP:

Typical Values for use on 2H:1V and flatter unreinforced slopes where vegetation is expected to be fully established in 1-3 years:			
Property	**Test Method**	**Units**	**Property Requirement**
Thickness	ASTM D-6525	in (mm)	0.30 (7.6)
Tensile Strength	ASTM D-6818	lbs/ft (kN/m)	150 x 150 (2.2 x 2.2)
Tensile Elongation	ASTM D-6818	%	25

2.2 TURF REINFORCEMENT MATS

A. Type IV RECP:

1. Matrix to possess strength and elongation properties to limit stretching and be maintained in water saturated condition.

2. All components of matrix stabilized against ultraviolet degradation and inert to chemicals normally encountered in natural soil environment.

Minimum Average Roll Values for use on 1.5H:1V and flatter mechanically reinforced or unreinforced slopes where vegetation is expected to be slow:			
Property	**Test Method**	**Units**	**Property Requirement**
Thickness	ASTM D-6525	in (mm)	0.4 (10.1)
Resiliency	ASTM D-6524	%	90
Mass Per Unit Area	ASTM D-6566	oz/sy (G/sq m)	10.0 (340)
Tensile Strength	ASTM D-6818	lb/ft (kN/m)	400 x 300 (5.8 x 4.3)
Tensile Elongation	ASTM D-6818	%	50 (max)
Light Penetration (% Passing)	ASTM D-6567	%	20
Moisture Absorption	ASTM D-570	%	0.01 (max)
UV Resistance	ASTM D-4355	%	80 at 1000 hrs

B. Type V RECP:

1. Material to exhibit very high interlock and reinforcement capacity with both soil and root systems and demonstrate high tensile modulus.

Minimum Average Roll Values for use on 1.5H:1V (mechanically reinforced or unreinforced) and flatter slopes where vegetation establishment is expected to be slow or where exceptional strength and durability are required:			
Property	**Test Method**	**Units**	**Property Requirement**
Thickness	ASTM D-6525	in (mm)	0.25 (6.35)
Resiliency	ASTM D-6524	%	70
Mass Per Unit Area	ASTM D-6566	oz/sy (G/sq m)	254 (7.5)
Tensile Strength	ASTM D-6818	lb/ft (kN/m)	2000 x 1800 (29.2 x 26.3)
Tensile Elongation	ASTM D-6818	%	50 (max)
Light Penetration (% Passing)	ASTM D-6567	%	50 (max)
Moisture Absorption	ASTM D-570	%	0.01 (max)
UV Resistance	ASTM D-4355	%	90 at 3000 hrs

C. Type VI RECP:

1. Material to exhibit very high interlock and reinforcement capacity with both soil and root systems and demonstrate high tensile modulus.

Minimum Average Roll Values for use on 1H:1V (mechanically reinforced or unreinforced) and flatter slopes where vegetation establishment is expected to be slow or where exceptional strength and durability are required:			
Property	**Test Method**	**Units**	**Property Requirement**
Thickness	ASTM D-6525	in (mm)	0.40 (10.2)
Resiliency	ASTM D-6524	%	80
Mass Per Unit Area	ASTM D-6566	oz/sy (G/sq m)	457.7 (13.5)
Tensile Strength	ASTM D-6818	lb/ft (kN/m)	4000 x 3000 (58.4 x 43.8)
Tensile Elongation	ASTM D-6818	%	40 x 35
Light Penetration (% Passing)	ASTM D-6567	%	15 (max)
Moisture Absorption	ASTM D-570	%	0.01 (max)
UV Resistance	ASTM D-4355	%	90 at 6000 hrs 85 at 10,000 hrs

2.3 ACCESSORIES

A. Ground Anchoring Devices:

1. Length: 8 to 18 inches (200 to 450 mm); sufficient ground penetration to resist pullout. Use longer anchors for loose soils.
2. U-shaped wire staples, metal pins, or triangular wooden stakes.
3. Wire staples: Minimum 8 gauge.
4. Metal pins: Steel, minimum 0.20 in (5 mm) in diameter with 1.5 in (40 mm) steel washer.

PART 3 - EXECUTION

3.1 PREPARATION

A. Grade and compact areas to be treated with RECP as indicated in the drawings, or as directed by Engineer.

B. Remove large rocks, soil clods, vegetation, and other sharp objects that could keep RECP from intimate contact with subgrade.

C. Prepare seedbed by loosening 2 to 3 inches (50 to 75 mm) of soil above final grade.

D. Select and apply soil amendments, fertilizer, and seed in accordance with Section 32 92 19 – Seeding to scarified surface prior to installation of RECP.

E. Construct 6 in x 12 in (150 x 300 mm) anchor trench at top of slope.

3.2 INSTALLATION

A. Install RECP at elevation and alignment indicated.

B. Extend RECP 2 to 3 feet (600 to 900 mm) over crest of slope, secure into trench with anchoring devices, backfill, and compact with specified soil or as directed by Engineer.

C. Unroll RECPs downslope, overlapping adjacent rolls minimum 3 inches (75 mm). Lay material loosely, maintaining direct contact with soil.

D. Secure RECP to slope with ground anchoring devices as follows:

Slope Grade (Batter)	Anchoring Frequency
Up to 3H:1V	1 anchor/square yard (1.2 anchors/square meter)
3H:1V to 2H:1V	1.5 anchors/square yard (1.8 anchors/square meter)
2H:1V to 1H:1V	2 anchors/square yard (2.5anchors/square meter)
Steeper than 1H:1V	2.5 anchors/square yard (3 anchors/square meter)

E. Alternate installation methods must be approved by Engineer prior to execution.

F. Where applicable, soil fill and seed the RECP:

1. Spread and lightly rake 0.5 to 0.8 in (12 to 20 mm) of fine topsoil into RECP to completely fill its thickness.
2. When using lightweight power equipment to fill RECP, avoid sharp turns. Do not drive tracked or heavy equipment over RECP.
3. Smooth out soil by barely exposing top portion of RECP. Do not place excessive soil above material.
4. Broadcast additional seed or mulch above soil-filled mat and water.

END OF SECTION 31 2500

SECTION 31 3716.13 - RUBBLE-STONE RIPRAP

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Type 2 Rock Blanket

2. Type 2 Rock Ditch Liner

3. Permanent Erosion Control Geotextile

Related Sections:

4. Division 31: Section 31 2500 Erosion and sedimentation controls.

5. Standard Specifications: MoDOT Standard Specifications, 2024 NOTE: Method of Measurement or Basis of Payment included in Standard Specifications do NOT apply.

1.3 PERFORMANCE REQUIREMENTS

A. Performance of Type 2 Rock Blanket: The finished surface of the riprap shall present an appearance free from segregation and with a proportionate quantity of the larger pieces showing. Acceptance of quality and size of material will be made by visual inspection at the job site.

B. Performance of Rock Ditch Liner: The material for rock ditch liner shall consist of a predominantly one-sized durable stone, shot rock or broken concrete. Acceptance by the engineer way be made by visual inspection at the job site.

C. Performance of Permanent Erosion Control Geotextile: Geotextile material shall be in accordance with the physical and chemical requirements of AASHTO M 288 for the specified application, except as modified herein.

1.4 SUBMITTALS

A. Geotextile material certifications: The contractor shall furnish a manufacturer's certification to the owner for each lot of material furnished, stating the name of the manufacturer, the chemical composition of the filaments or yarns and certifying that the material supplied is in accordance

with this specification. The certification shall include or have attached, typical results of tests from specific lots for all specified requirements.

B. Type 2 Rock Blanket- The Contractor shall submit a material certification to verify the gradation requirements of the Type 2 Rock Blanket.

C. Type 2 Rock Ditch Liner – The Contractor shall submit a material certification to verify the gradation requirement are met for the Rock Ditch Liner.

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify layout information shown on Drawings in relation to property survey and existing structures or other conflicts. Verify dimensions by field measurements.

PART 2 - PRODUCTS

2.1 TYPE 2 ROCK BLANKET

A. General: Comply with Section 611.30 of the current version of the Missouri Standard Specification for Highway Construction.

B. The material for rock blanket riprap shall be durable stone or broken concrete containing a combined total of no more than 10 percent of soil, sand, shale or non-durable rock. At least 60 percent of the mass shall be of pieces having a volume of one cubic foot or more.

2.2 TYPE 2 ROCK DITCH LINER

A. General: This shall consist of material with a predominant rock size of 6 inches, a maximum rock size of 10 inches and a gradation such that no more than 15 percent will be less than 3 inches.

B. Minimum Thickness: The minimum thickness of rock ditch liner shall be 18 inches.

2.3 PERMANENT EROSION CONTROL GEOTEXTILE

A. Minimum permittivity: The permittivity of the geotextile shall be 1.0 per second at a minimum.

B. Survivability: Geotextile material shall be either an AASHTO Class 1 or Class 2.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.

1. Do not begin installation before final grading is completed unless otherwise permitted by engineer.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Type 2 Rock Blanket: A trench at the toe of the slope shall be excavated to the depth shown in the Drawings or a minimum of 2 feet if not shown. The riprap shall be placed on the finished and compacted slope to the specified thickness and extent. Riprap shall be manipulated such that most of the flat sides are in contact to eliminate as many of the large voids as possible. This work shall be subject to the approval of the engineer.

B. Rock Ditch Liner: Rock ditch liner shall be placed to the approximate shape and thickness shown on the plans for the specified ditch or as directed by the engineer. The rock shall be dumped on a subgrade of reasonably uniform density and left in a rough condition meeting the approval of the engineer.

C. Geotextile: This material shall be placed in accordance with AASHTO M 288 for an erosion control application. Geotextile shall be placed under both Type 2 Rock Blanket and Rock Ditch Liner .

END OF SECTION 31 3716.13

SECTION 31 6216 – STEEL PILES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Grout

B. Related Sections:

1. Standard Specifications: MoDOT Standard Specifications, 2023
   a. NOTE: Method of Measurement or Basis of Payment included in Standard Specifications do NOT apply.
   b. https://www.modot.org/missouri-standard-specifications-highway-construction

1.3 REFERENCES

A. Missouri Standard Specifications for Highway Construction, Sections 702 (https://www.modot.org/missouri-standard-specifications-highway-construction).

1.4 SUBMITTALS

A. Documentation:

1. For structural steel piles and shells for cast-in-place piles, the contractor shall furnish two copies of a certification from the pile manufacturer or fabricator setting out the designated specification with which the material furnished complies.

PART 2 - PRODUCTS

2.1 STRUCTURAL STEEL PILES

A. Structural steel piles shall be of the size, weight and structural shape shown on the plans. Piles shall not have a camber or sweep in excess of 1/8 inch multiplied by the length of

pile in feet divided by five. Structural steel piles shall be stored such that damage to the piling does not occur.

PART 3 - EXECUTION

3.1 APPLICATION

A. Load-bearing piles shall not be driven until after the excavation for the footing has been substantially completed. The heads of piles shall be protected against damage during driving. The procedure incident to the driving of piles shall not subject piles to excessive and undue abuse. Steel shells and structural steel piles shall hold the original form without distortion after being driven and after adjacent piles have been driven. Any load-bearing pile broken or damaged by reason of internal defects, by improper driving, or driven outside of the pile's proper location, shall be removed and replaced, or a second adjacent pile may be driven if this can be done without detriment to the structure, as determined by the engineer.

B. Final position of piles shall be no more than 1/4 inch per foot from the vertical or from the batter line shown on the plans. The maximum variation of the head of the pile from the position shown on the plans shall be no more than 2 inches, except that piles in footings entirely below the finished ground line may not vary more than 6 inches. All piles forced upward by the driving of adjacent piles or by any other cause shall be redriven to the required minimum nominal axial compressive resistance and penetration.

END OF SECTION 31 6216

SECTION 32 1123 – AGGREGATE BASE COURSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Base courses for trails and pavements.

B. Related Sections:

1. Division 31 Section 31 2300 "Excavation and Fill" for grading requirements.

2. Division 31 Section 31 2313 “Subgrade Preparation”

3. Standard Specifications: MoDOT Standard Specifications, 2024 NOTE: Method of Measurement or Basis of Payment included in Standard Specifications do NOT apply.

1.3 SUBMITTALS

A. Test Reports in accordance with Sec. 304.4 of the MoDOT Standard Specifications: For each of the following parameters required:

1. Density.

2. Thickness.

B. Inspection Reports: For the following parameters indicated below:

1. Gradation and deleterious material.

2. Plasticity Index.

1.4 PROJECT CONDITIONS

A. Prior to placement of any aggregate base course, the subgrade shall be prepared in accordance with Section 31 2300.

B. Soft spots shall be removed to a maximum depth of 24 inches and backfilled with approved stable material prior to placing any base material on that portion and shall comply with Division 31 2313 Subgrade Preparation.

C. The moisture content of the top 6 inches of the finished subgrade at the time the base is placed shall be no less than 95 percent of maximum density.

D. Aggregate base shall not be placed on frozen subgrade.

PART 2 - PRODUCTS

2.1 AGGREGATE BASE MATERIALS

A. Shot Rock Subgrade: Shall comply with Division 31 2313 Subgrade Preparation.

B. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

C. Base Course: Shall comply with sections 1007 & 304 of the MoDOT Specifications for Highway Construction where called out as “Type 5 Aggregate base on the typical sections of the plans. Where 2” minus is called out on the typical sections, placement of the base shall comply with section 304 of the MoDOT Specifications for Highway Construction and the material shall be equivalent to that of 2” rolled stone base.

D. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.

PART 3 - EXECUTION

3.1 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

A. Place base course aggregate on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place base course aggregate under concrete pavements and aggregate surfaces as follows:

1. Place base course aggregate material over subbase course or subgrade under pavement as indicated on typical section sheets.

2. Shape base course aggregate to required elevations and cross-slope grades.

3. Place base course aggregate 6 inches or less in compacted thickness in a single layer.

4. Place base course aggregate that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.

5. Compact base course aggregate at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

6. Each layer shall be compacted to the specified density or dynamic cone penetration index value before another layer is placed.

7. If at any time the compacted aggregate base or subgrade becomes unstable, the contractor, at the contractor's expense, shall restore the earth subgrade and the aggregate base to the required grade, cross section and density.

C. Pavement Shoulders: Place shoulders along edges of base course to prevent lateral movement. Construct shoulders, at least 6 inches wide, base course aggregate materials and compact simultaneously with each layer to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.2 FIELD QUALITY CONTROL

A. Third Party inspector working under contract with the general contractor will perform the following inspections:

1. Aggregate base density and thickness, conduct a minimum of 1 density test per 1,000 tons, after compaction, or minimum 1 per day.

3.3 MAINTENANCE

A. The contractor shall maintain, at the contractor’s expense, the required density and surface condition of any portion of the completed aggregate base until either the prime coat or a succeeding course or pavement is placed.

END OF SECTION 32 1123

SECTION 32 1313 - CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Trail Pavement

B. Related Sections:

1. Division 03: Section 03 2100 Reinforcement Bars

2. Division 32: Section 32 1123 Aggregate Base Courses

3. Division 01: Section 01 5526 Traffic Control

4. Standard Specifications: MoDOT Standard Specifications, 2024 NOTE: Method of Measurement or Basis of Payment included in Standard Specifications do NOT apply.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Other Action Submittals:

1. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

C. Qualification Data: For qualified testing agency.

D. Material Certificates: For the following, from manufacturer:

1. Cementitious materials.
2. Steel reinforcement and reinforcement accessories.
3. Admixtures.
4. Curing compounds.
5. Joint fillers.

E. Material Test Reports: For each of the following:

1. Aggregates.

F. Field quality-control reports.

G. Daily concrete quality control tests must be accomplished by an individual certified as ACI Concrete Field Testing Technician, Grade 1, or equivalent program and daily results must be provided to the Engineer.

H. Concrete 28-day compressive strength tests to be completed by the Contractor and results submitted to the Engineer.

I. Provide delivery tickets for ready-mix concrete or weighmasters certificate per ASTM C94, including weights of cement and each size aggregate and amount of water added at the plant. Record the amount of water added on the job on the delivery ticket.

1.5 QUALITY ASSURANCE

A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94 requirements for production facilities and equipment.

B. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

C. Concrete Testing Service: Engage a qualified testing agency to perform material evaluation tests and to design concrete mixtures.

D. ACI Publications: Comply with ACI 301 unless otherwise indicated.

1.6 PROJECT CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

1. Use flexible or uniformly curved forms for curves with a radius of 100 feet or less.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

A. Joint Dowel Bars: ASTM A 615, Grade 60 plain-steel bars. Cut bars true to length with ends square and free of burrs.

B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

2.3 MACRO-SYNTHETIC FIBER REINFORCED CONCRETE

A. Macro-Synthetic Fiber. The macro-synthetic fibers shall be manufactured from virgin polyolefins (polypropylene and polyethylene) and shall comply to ASTM D7508/D7508M with the following additional criteria:

Property	Minimum Criteria
Fiber Length, in., minimum	1.50 in
Aspect Ratio (length divided by equivalent diameter)	45 - 150
Relative Tensile Strength, ksi., minimum	50 ksi

B. Macro-Synthetic Fiber Reinforced Concrete. The MSFR concrete shall be a Type III Synthetic Fiber-Reinforced concrete mixture in accordance with ASTM C 1116.4.1.3.

2.4 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project:

1. Portland Cement: ASTM C 150, gray portland cement Type I.

B. Normal-Weight Aggregates: MoDOT - Missouri Standard Highway Specifications for Highway Construction - uniformly graded. Provide aggregates from a single source

1. Maximum Coarse-Aggregate Size: MoDOT Section 1005.2 All coarse aggregate for concrete shall consist of sound, durable rock, free from objectionable coatings and frozen and cemented lumps. The percentage of deleterious substances shall not exceed the following values, and the sum of percentages of all deleterious substances, exclusive of Items 5 and 6, shall not exceed 6.0 percent. For crushed stone, the percentage of wear shall not exceed50 when tested in accordance with AASHTO T 96. Crushed stone shall be obtained from rock of uniform quality.
2. Fine Aggregate: MoDOT Section 1005.3 Fine aggregate for concrete shall be a fine granular material naturally produced by the disintegration of rock of a siliceous nature or shall be manufactured from an approved limestone or dolomite source. Fine aggregate shall be free from cement or conglomerated lumps and shall not have any coating of injurious material. Fine aggregate shall produce a mortar having a seven-day compressive strength of at least 90 percent of a control mortar developed at the same proportions, using standard Ottawa sand. Tests shall be performed in accordance with AASHTO T 106.

C. Water: Potable and complying with ASTM C 94.

D. Air-Entraining Admixture: ASTM C 260.

E. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

1. Water-Reducing Admixture: ASTM C 494, Type A.
2. Retarding Admixture: ASTM C 494, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017, Type II.

2.5 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Conspec by Dayton Superior; Aquafilm.
b. Dayton Superior Corporation; Sure Film (J-74).
c. Euclid Chemical Company (The), an RPM company; Eucobar.
d. L&M Construction Chemicals, Inc.; E-CON.
e. Meadows, W. R., Inc.; EVAPRE.
f. Sika Corporation, Inc.; SikaFilm.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Conspec by Dayton Superior; [DSSCC Clear Resin Cure].
b. Dayton Superior Corporation; Day-Chem Rez Cure (J-11-W).
c. Euclid Chemical Company (The), an RPM company; Kurez W VOX.
d. L&M Construction Chemicals, Inc.; L&M CURE R.
e. Meadows, W. R., Inc.; 1100-CLEAR SERIES.

2.6 RELATED MATERIALS

A. Joint Fillers:
1. ASTM D 1751, asphalt-saturated cellulosic fiber in preformed strips.
2. Semi-rigid, Closed-cell Polypropylene Foam, Preformed Expansion Joint Filler. This material shall be semi-rigid, closed-cell polypropylene foam, preformed expansion joint filler in accordance with ASTM D8139.

2.7 DETECTABLE WARNING MATERIALS

A. Detectable Warning Panels: ADA compliant detectable warning panels utilizing truncated domes. These items shall be in accordance with the following requirements.

1. Color: Red

2. Size: Domes shall have a base diameter of 0.9 to 1.4 inches. The top diameter shall be 50 to 65 percent of the base diameter. The dome height shall be 0.2 inches. Dome center-to-center spacing shall be 1.6 to 2.4 inches with a minimum base-to-base spacing of 0.65 inches. Stamped concrete will not be accepted. Truncated dome surfaces shall extend a minimum of 24 inches in the direction of sidewalk travel and the full width of the curb ramp (exclusive of flares), the landing, or blended transition. The panels shall be made of a durable material. The panels shall carry a manufacturer warranty covering all defects for a five-year period from the time of installation.

3. Products: Subject to compliance with requirements, available products that may be incorporated into the work include, those products found on the Qualified Listing FS-1067 Table 1 on the Missouri Department of Transportation website at the following location:

https://www.modot.org/sites/default/files/documents/FS1067T1_1.pdf

2.7 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301 (ACI 301M), for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that meet or exceed requirements.

B. Proportion mixtures to provide normal-weight concrete with the following properties:

1. Compressive Strength (28 Days): 4000 psi.
2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45
3. Slump Limit: 4 inches, plus or minus 1 inch.

C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:
1. Air Content: 5 1/2 percent plus or minus 1.5 percent.

D. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

E. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.
1. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

F. Cementitious Materials: Limit percentage by weight of cementitious materials other than portland cement according to ACI 301 requirements for concrete exposed to deicing chemicals

2.8 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94 and ASTM C 1116. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase in one direction. Limit vehicle speed to 3 mph (5 km/h).
2. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch according to requirements in Division 31 Section 31 2300 "Excavation and Fill."

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

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

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

1. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.
2. Construction Joint Reinforcing Bars: 18” length deformed, #4 bars

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.

1. Locate expansion joints at intervals of 150 feet unless otherwise indicated.
2. Extend joint fillers full width and depth of joint.
3. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.

4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
6. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.
7. Isolation Joint Reinforcing Bars: 18" length smooth, epoxy coated #4 bars

D. Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows, to match jointing of existing adjacent concrete paving:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate grooving-tool marks on concrete surfaces.

2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 3/16-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

E. Edging: After initial floating, tool edges of paving, and joints in concrete with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

3.5 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation, and items to be embedded or cast-in.

B. Remove snow, ice, or frost from subbase surface before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

G. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels and joint devices.

H. Screed paving surface with a straightedge and strike off.

I. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

J. Slip-Form Paving: Use design mixture for automatic machine placement. Produce paving to required thickness, lines, grades, finish, and jointing.

1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of slip-form paving machine during operations.

K. Cold-Weather Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.

L. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.

M. Fiber material shall be delivered, stored, handled, and mixed in accordance with manufacturer's guidelines. The fiber shall be added at the concrete plant at the addition rate specified in the mix design. The fiber manufacture shall be on site during the first day’s production and shall specify the mixing time required to ensure adequate dispersion of the fibers and achieve a homogenous and workable mixture.

3.6 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven

floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.

C. Any exposed fibers shall be burned as directed by the engineer once the concrete cures at no direct pay.

3.7 DETECTABLE WARNINGS

A. Installation: Follow manufacturer's recommendations for the installation of Detectable Warning Panels. Panels shall match the slope of the adjacent pavement and shall be placed such that no vertical displacement occurs between the panel and the surrounding pavement.

3.8 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

D. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound or a combination of these as follows:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

    a. Water.
    b. Continuous water-fog spray.
    c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover, placed in widest practicable width, with sides and ends lapped at least 12 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears occurring during installation or curing period using cover material and waterproof tape.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas that have been subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating, and repair damage during curing period.

3.9 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 and as follows (these tolerances will not provide for leeway from the requirements of maintaining ADA standards):

1. Elevation: 3/4 inch.
2. Thickness: Plus 3/8 inch, minus 1/4 inch.
3. Surface: Gap below 10-foot-long, unleveled straightedge not to exceed 1/2 inch.
4. Joint Spacing: 3 inches.
5. Contraction Joint Depth: Plus 1/4 inch, no minus.
6. Joint Width: Plus 1/8 inch, no minus.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Contractor shall engage a qualified testing agency to perform tests and inspections.

B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.

    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when it is 80 deg F and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C 39; test one specimen at seven days and two specimens at 28 days.

    a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

D. Test results shall be reported in writing to Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and

inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

E. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer.

F. Concrete paving will be considered defective if it does not pass tests and inspections.

G. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

H. Prepare test and inspection reports.

3.11 REPAIRS AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Engineer.

B. Drill test cores, where directed by Engineer, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.

C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 32 1313

SECTION 32 1540 – CRUSHED STONE SURFACING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Gravel Trail Pavement, “Roller Compacted Fines”.

2. Gravel for Driveway and Road Construction, “Roller Compacted Fines”.

B. Related Sections:

1. Division 01: Section 015526 Traffic Control

2. Division 31: Section 312300 Excavation and Fill

3. Specifications: MoDOT Standard Specifications, 2024 NOTE: Method of Measurement or Basis of Payment included in Standard Specifications do NOT apply

1.3 SUBMITTALS

A. Aggregate Gradations: For crushed stone surface.

1.4 QUALITY ASSURANCE

A. Material shall be spread to a uniform thickness over the base as specified on the plans.

B. Material shall be compacted in accordance with Missouri Standard Specification for Highway Construction section 304.3.5, or as directed by the Owner’s representative.

C. Surface shall be maintained by the contractor until final project acceptance is made.

1.5 PROJECT CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 AGGREGATE

A. Material for surfacing on the trail shall be equivalent to 3/8” minus, waste lime, or shall comply with Missouri Standard Specifications for Highway Construction section 1006, Grade B or C.

B. Gravel material used as a pavement surface for the required driveway and road work shall comply with Missouri Standard Specifications for Highway Construction section 1006 for Grade A or B material or shall be a material equivalent to a Type 1 aggregate for base in accordance with Sec 1007.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface below surface paving to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase in one direction. Limit vehicle speed to 3 mph (5 km/h).
2. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch according to requirements in Division 31 Section 31 2300 "Excavation and Fill."

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

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

END OF SECTION 32 1540

SECTION 32 1723- PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Midblock Crossing Markings.

2. 4” and 6” Pavement Lines

B. Related Sections:

1. Standard Specifications: MoDOT Standard Specifications, 2024
   a. NOTE: Method of Measurement or Basis of Payment included in Standard Specifications do NOT apply

1.3 PERFORMANCE REQUIREMENTS

A. Description: This work shall consist of furnishing and placing preformed pavement marking tape at locations shown on the drawings or as directed by the engineer.

B. All pavement marking shall be in accordance with the latest edition of the MUTCD. Likewise all pavement marking shall be in accordance with the Federal Highway Administration (FHWA) *Standard Highway Signs*.

1.4 SUBMITTALS

A. The manufacturer’s installation specifications and product data shall be provided as requested by the engineer.

PART 2 - PRODUCTS

2.1 TEMPORARY REMOVABLE PAVEMENT MARKING TAPE

A. Temporary removable pavement marking tape shall be capable of being removed and shall leave no objectionable or misleading image or damage to the pavement after removal. The tape shall have a minimum specific luminance as shown for White and

Yellow per ASTM D 4592, expressed as millicandelas/m2/lux. The tape shall be applies to an 8 x 36-inch panel per instrument recommendation for pavement marking tape and measured in accordance with MoDOT Test Method TM 8 at prescribed CEN geometry. Tape shall have a pre-coated pressure sensitive adhesive requiring no activation procedures. The adhesive shall be resistant to normal roadway chemicals or materials. The tape shall be weather-resistant and show no appreciable fading, lifting or shrinkage during the tape's useful life. Samples of the tape applied to standard specimen plates and tested in accordance with Federal Test Method No. 141, Method 6192, for 1,000 cycles, using a CS-17 wheel and 1,000-gram load shall not expose the backing material over more than five percent of the abraded area.

2.2 PERMANENT PAVEMENT MARKING PAINT

A. Material for permanent pavement marking paint shall be in accordance with High Build Waterborne Paint standards. Acrylic waterborne pavement marking paint shall contain no more than 3,20 ppm lead or more than 800 ppm chromium, based on dry weight. The finished paint shall be formulated and manufactured from quality material and shall be a fast-drying, water-based, acrylic resin-type paint capable of withstanding air and roadway temperatures without bleeding, staining, discoloring, or deforming. The dried paint film shall be capable of maintaining original dimensions and placement without chipping, spalling or cracking. The dry paint film shall not deteriorate from contact with normal roadway chemicals or materials. The average RL for concrete and bituminous surfaces shall be at least 100 for 15-meter geometry or 75 for 30-meter geometry, when measured in the wheel path area. The paint shall have a durability rating of at least 4 for both concrete and bituminous surfaces when tested in the wheel path area of the NTPEP test deck.

B. No paint shall be used that is more than 15 months old.

C. Glass beads will not be utilized for this work.

2.3 PREFORMED PAVEMENT MARKING TAPE

A. Material for preformed pavement marking tape shall be in accordance with Section 1048.10 of the current version of the Missouri Standard Specification for Highway Construction.

PART 3 - EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

A. All temporary removable pavement tape shall, at the contractor's expense, provide and maintain temporary pavement marking in accordance with the plans until permanent pavement markings are in place. Pavement markings shall be replaced in the same configuration as the previously existing pavement marking unless otherwise shown on the plans or directed by the engineer.

B. All permanent pavement marking paint shall be a High Build Waterborne Paint designed for pavement marking. Paint shall be applied with self-propelled equipment using spray guns designed and adjusted to apply paint at the required thickness and width. Finished markings shall have well-defined edges, and uniform cross section thickness. If there is any evidence of gun clogging, splattering or uneven paint distribution, painting operations shall cease until equipment is restored to proper operation. Waterborne paint shall not be heated above 120 degrees F before application. Waterborne paint shall only be used as specified in the contract and plans. Waterborne paint shall not be used for stop lines, arrows, words and symbols.

C. When surface preparation is required, the area prepared shall be 1 inch wider than the final pavement marking. For waterborne paint applications, the pavement surface temperature and ambient air temperatures shall be above 50 degrees F and rising before marking operations may begin. Waterborne paint shall not be applied if the forecast conditions for the eight hours immediately following final application include precipitation or temperatures below 50 degrees.

D. Temporary removable pavement marking tape shall be installed according to the manufacturer's recommendations and will only be used for temporary pavement markings.

E. Preformed pavement marking tape shall be installed according to the manufacturer's recommendations.

F. Type 2 preformed pavement marking tape shall be installed in a groove in accordance with the manufacturer's recommendations.

G. Arrows, words and symbols shall be white and shall use permanent pavement marking paint. Crosswalk and caution areas shall be yellow paint. All permanent pavement markings shall use High Build Waterborne Paint.

H. Permanent pavement markings will use High Build Waterborne Paint.

I. Paint will be applied to a wet thickness of no less than 25 mils.

J. Contractor shall allow 20 calendar days for concrete paving to cure prior to placing any permanent pavement markings.

K. Damage to pavement marking as a result of the contractor's operations, shall be repaired at the contractor's expense.

3.2 ACCEPTANCE

A. Acceptance for pavement markings will be based on visual inspection for correct width, location, color, alignment, adherence to pavement, sufficient thickness, and length.

B. Contractor is required to provide manufacturers project information to the engineer.

END OF SECTION 32 1723

SECTION 32 9200 – TURF AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including General and Supplementary Conditions, Division Specification sections, and the Approved DNR Land Disturbance Permit, apply to the work specified in this section.

1.2 DESCRIPTION OF WORK

A. Furnish all materials, labor, equipment and services necessary to perform all Work.

B. Work included in this section includes clearing of weeds, seed bed preparation, installation of erosion control fabric and seeding operations required for seeding of the areas shown on drawings.

1.3 SPECIFICATIONS AND STANDARDS

A. U.S. Department of Agriculture: SRA 156 U.S. Department of Agriculture, Rules and Regulations under the Federal Seed Act.

B. American Joint Committee on Horticultural Nomenclature Standard: 1942 Edition Standardized Plant Names.

PART 2 - PRODUCTS

2.1 SEED

A. All seed shall be furnished in sealed, standard containers, unless otherwise approved. Seed which has become wet, moldy, or otherwise damaged will not be acceptable.

B. Each container of seed shall be fully labeled in accordance with the Federal Seed Act and seed certifications shall be signed and made part of seed invoices.

C. Seed shall be:

1. 50 percent Kentucky Bluegrass
2. 30 percent Creeping Red Fescue
3. 20 percent Perennial Rye

D. Invoices and tags for seed shall show type furnished. Upon acceptance of the seeded areas, a final check of total quantities of seed used will be made against total area seeded and if minimum rates of application or specified quantities have not been met, the Architect will require distribution of additional quantities of these materials to make up minimum application specified.

2.2 FERTILIZER

A. Fertilizer shall be uniform in composition, free-flowing, suitable for application with approved equipment and delivered to the site unopened in original containers each bearing the manufacturer's guaranteed analysis and in conformity with state fertilizer laws. Fertilizer shall contain the following minimum percentage of plant food by weight.

1. 12 percent available nitrogen
2. 12 percent available phosphoric acid
3. 12 percent available potash

B. Fertilizer application rates shall be 600 pounds per acre with a minimum of 120 lbs applied.

C. Invoices for fertilizer shall show grade furnished. Upon acceptance of the seeded areas, a final check of total quantities of fertilizer used will be made against total area seeded and if minimum rates of application or specified quantities have not been met, the architect will require distribution of additional quantities of these materials to make up minimum application specified.

2.3 EROSION CONTROL FABRIC

A. Fabric shall be of photodegradable, natural and/or polymer fibers mechanically bound together by two rapidly-degrading, synthetic or natural fiber netting with a longevity of 3 months minimum.

2.4 STAPLES

A. Staples shall be a No. 11 gauge steel wire formed into a "U" shape, 6 inches long.

PART 3 - EXECUTION

3.1 GROUND PREPARATION

A. General: The ground areas are to be seeded and fertilized as indicated on the Drawings and/or as specified herein. Equipment necessary for the proper preparation of the ground surface and for handling and placing all required materials shall be on hand, in good condition and shall be approved before the Work is started.

B. Clearing: Prior to tillage, seeding or other specified operations, all vegetation which might interfere with the indicated treatment of the areas shall be mowed, grubbed, raked and the debris removed from the site. Prior to or during grading and tillage operations, the ground surface shall be cleared of materials which might hinder final operations. Areas which have been disturbed shall be finish graded and/or developed as indicated on the Drawings or as specified.

C. Tillage: After the areas required to be seeded have been brought to the finish grades as specified, they shall be thoroughly tilled to a depth of at least 6 inches by plowing, disking, harrowing or other approved methods until the condition of the soil is acceptable

to the Architect. Work shall be performed only during period when beneficial results are likely to be obtained. When conditions are such by reason of drought, excessive moisture, or other factors that satisfactory results are not likely to be obtained, Work shall be stopped. Work shall be resumed only when desired results are likely to be obtained.

D. Leveling: Any undulations or irregularities in the surface resulting from tillage, fertilizing or other operations shall be leveled with a float drag before seeding operations are begun.

E. Fertilizing: Fertilizer shall be distributed uniformly at the rate previously specified per 1,000 square feet over the areas to be seeded and shall be incorporated into the soil to a depth of at least 3 to 4 inches by disking, harrowing or other approved methods. The incorporation of fertilizer may be a part of the tillage operation hereinbefore specified. Distribution by means of an approved seed drill equipped to sow seed and distribute fertilizer at the same time will not be accepted. Fertilizer shall be incorporated into the soil a minimum of 10 days before seed is planted.

F. Inspection: A minimum of 48 hours prior notice must be given to the Construction Administrator before fertilizing may commence.

G. Planting Time: All seeding Work shall be done between the dates of April 1 to May 15 for spring planting and from August 15 to October 15 for fall planting except as otherwise directed in writing by the Construction Administrator.

H. Planting Condition: No planting shall be done until a permanent source of water is available at the site for use by the owner.

3.2 SEEDING

A. General: Prior to seeding, any previously prepared seedbed areas compacted or damaged by interim rains, traffic, or other cause shall be reworked to restore the ground condition previously specified. Seed shall be planted by drill seeding.

B. Drill Seeding: Seed shall be uniformly drilled to an average depth of ½ inch and at the rate of 8 pounds per 1,000 square feet using equipment having drills not more than 6 ½ inches apart. Row markers shall be used with the drill seeder.

C. Rolling: Immediately after seeding, except for slopes 3 horizontal to 1 vertical and greater, the entire area shall be firmed with a roller not exceeding 90 pounds for each foot of roller width. Do not roll areas seeded with seed drills equipped with rollers.

D. Inspection: A minimum of 48 hours prior notice must be given to the Construction Administrator before seeding may commence.

E. All permanent seeding will be completed by October 15 unless prior coordination has been completed with the engineer and owner.

3.3 HYDROSEEDING

A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

B. Mix slurry with nonasphaltic or other approved tackifier.

C. Apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than 1500-lb/acre dry weight, and seed component is deposited at not less than the specified seed-sowing rate.

3.4 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

C. Remove non-degradable erosion-control measures after grass establishment period.

3.5 INSTALLATION OF EROSION CONTROL FABRIC

A. Fabric shall be rolled out in place. Fabric shall be applied without stretching and shall lie smoothly but loosely on the soil surface. The Contractor shall refer to the Drawings for details of fabric fastening.

B. Application of the erosion control fabric shall occur the same day that the seeding of an area has taken place.

C. Fabric shall completely cover all areas which are shown on the drawings to be protected from erosion. After fabric installation, the entire area shall be rolled with a smooth roller weighing between 200 to 250 pounds. After rolling, the fabric shall be in intimate contact with the soil surface at all points. Any clods, etc., which hold the fabric off the ground should be removed. The fabric shall be forced down into any depressions and held there with a staple.

3.6 MAINTENANCE

A. General: The project areas shall be kept clean at all times and care shall be taken that use of the premises shall not be unduly hampered by Work herein specified. The intent of this Section is to ensure a healthy, well-established turf, and prevent soil erosion in compliance with the Land Disturbance Permit issued by the Missouri Department of Natural Resources, as provided in Appendix 1.

B. Responsibility: The owner shall be responsible for maintenance of all seeded areas upon completion of seeding and general acceptance by the Construction Administrator.

C. Damage: Damage to seeded areas during the project shall be repaired by the persons responsible for causing such damage.

3.7 GENERAL ACCEPTANCE

A. The Construction Administrator shall make an inspection of the seeded areas upon completion of seeding. Seeded areas shall be considered acceptable if the specified quantities of fertilizer & seed have been properly applied.

3.8 GUARANTEE

A. The contractor is responsible for the proper application of the fertilizer & seeding. Watering, weeding, re-seeding, and mowing will be the responsibility of the Owner after proper application of the seed.

END OF SECTION 329200

SECTION 33 4113 – FOUNDATION DRAINAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Drain pipe shall be installed according to the Plans.

1.3 SUBMITTALS

A. The Contractor shall provide the Engineer and Owner product data on the type of pipe to be used in the project prior to the beginning of construction.

B. Non-woven geosynthetic drainage fabric product data

PART 2 - PRODUCTS

2.1 Pipe shall comply with the options listed on the plans.

2.2 Non-woven geosynthetic drainage fabric material, minimum 3 oz weight.

PART 3 - EXECUTION

3.1 Underdrains

A. Underdrains shall be constructed in the subgrade to provide drainage at the locations shown on the plans or as directed by the engineer. The underdrains shall have a nominal trench width of 12” and a depth of 12” below the subbase

B. Underdrains will generally be discharged to the nearest stormwater structure or to the nearest outlet location, as shown in the plans. If into a ditch, the pipe shall be located a minimum of six (6) inches above the bottom of ditch. Any pipe beyond the edge of pavement shall not contain perforations. Seal around underdrain with clay near outlets to confine water in the pipe.

1. Depth for installation of drain tile will comply with details shown in the plans and shall always promote positive drainage.

C. All underdrains placed under pavement shall be perforated schedule 40 PVC. In locations outside the pavement corrugated perforated polyethylene pipe may be used with the approval of the engineer.

D. Trenches shall be lined with non-woven geosynthetic.

3.2 Vertical Drains

A. Install according to details and instructions listed on the Contract Plans.

END OF SECTION 33 4113

SECTION 33 4213 – PIPE CULVERTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Pipe and fittings.

1.3 SUBMITTALS

A. All pipes and fittings shall be certified by manufacturer in meeting the ASTM and AASHTO specifications.

B. Pipe anchoring system for HDPE pipe installations.

C. Joint design details shall be submitted for approval together with design data and test results verifying the adequacy of the joint design.

D. RCP exceeding a slope of 5% or more will require an RCP joint restraint shop drawing.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Protect pipe, pipe fittings, and seals from dirt and damage.

B. Particular care shall be taken to protect pipe bell and spigot ends. Handling equipment and procedures shall be in accordance with the approved manufacturer's recommendation for proper handling of his products. Improper handling of pipe that damage pipe will be rejected for installation.

PART 2 - PRODUCTS

2.1 CONCRETE PIPE

A. At the contractor’s option, reinforced concrete pipe may be used for culvert construction.

B. Except as modified or otherwise provided in this section, the manufacture of concrete pipe shall be governed by ASTM C-76 and ASTM C-507.

C. Except for fittings and closure pieces, each piece of the pipe shall not be less than eight feet long for pipe diameters 48 inches or less and shall not be less than six feet long for pipe diameters larger than 48 inches.

D. The pipe class in each case shall be as designated on the plans, and reinforced concrete pipes shall not be less than Class II.

E. Mastic joints shall be required for all pipe shapes meeting ASTM C990.

F. Lift holes are prohibited for all concrete storm sewer pipes.

G. No concrete pipe shall be delivered to the site of the work until concrete control cylinders representing such pipe shall have attained a compressive strength of at least 80% of the specified minimum 28 day strength.

2.2 HIGH DENSITY POLYETHELYNE PIPE (HDPE)

A. At the contractor's option, HDPE pipe may be used for culvert construction.

B. Type S, double wall (smooth interior, corrugated outer wall), high density polyethylene pipe utilizing a bell and spigot joint system and providing a soil tight joint.

C. Pipe shall meet the following specifications.

1. ASTM F2306 Standard Specification for 12 to 60 in. Annular Corrugated Profile-Wall Polyethylene (PE) Pipe and Fittings for Gravity-Flow Storm Sewer and Subsurface Drainage Applications.
2. AASHTO N292 and M294 Standard Specifications for corrugated PE pipe.
3. ASTM D3350 Standard Specification for Polyethylene Plastic Pipes and Fittings Materials.
4. ASTM F477 Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe meeting or exceeding the soil-tight joint performance requirements of AASHTO M252, AASHTO M294, or ASTM F2306.
5. ASTM D2321 Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.

2.3 STEEL PIPE AND FITTINGS

A. Corrugated metal pipe shall only be used where specifically indicated on the Drawings.

B. Corrugated-Steel Pipe and Fittings: ASTM A 760, Type I with fittings of similar form and construction as pipe.

1. Standard-Joint Bands: Corrugated steel.
2. Coating: Zinc.

2.4 MARKINGS

A. All pipes and, fittings shall have markings signifying the specification designation, nominal; size, trade name or manufacturer's designation code of origin.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavation, trenching, and backfilling are specified in Division 31 Section 31 2300 "Excavation and Fill."

3.2 PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install couplings according to manufacturer's written instructions and other installation requirements.

3.3 HDPE PIPE ANCHORS

A. Unless shown otherwise on the plans, all HDPE pipe will be installed with a pipe anchoring system consisting of galvanized or stainless steel rods with a minimum of 4” diameter auger placed on either side of the pipe, connected over the top of the pipe with a strap. Strapping shall fit snug against the pipe in the groove between pipe corrugations.

B. Hardware for strapping connections and strap shall be the same material as the rods.

C. Anchors shall be placed approximately 3 feet from each pipe end, except at structure connections. Anchors shall be placed at outlet or inlet ends of pipes attached to end sections.

3.4 CONCRETE PIPE RESTRAINTS

A. Where reinforced concrete pipe is chosen and the slope of the pipe will be 5.0% or greater, the reinforced concrete pipe shall be tied together and to the end section with a mechanical method such as tie rods to prevent the pieces of pipe from coming apart at the joint. The restraint type shall be approved by the engineer prior to construction.

3.4 PIPE JOINT CONSTRUCTION

A. Join gravity-flow, nonpressure drainage piping according to the following:
   1. Join corrugated steel sewer piping according to ASTM A 798.
   2. Join dissimilar pipe materials with nonpressure-type flexible couplings.

3.5 FIELD QUALITY CONTROL

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Defects requiring correction include the following:

    a. Alignment: Less than full diameter of inside of pipe is visible.
    b. Damage: Crushed, broken, cracked, or otherwise damaged piping.
    c. Infiltration: Water leakage into piping.
    d. Exfiltration: Water leakage from or around piping.

2. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
3. Reinspect and repeat procedure until results are satisfactory.

3.6 CLEANING

A. Clean interior of piping of dirt and superfluous materials.

END OF SECTION 33 4213

SECTION 33 4900 - STORM DRAINAGE STRUCTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. End Sections.

B. Related Sections:
1. Standard Specifications: MoDOT Standard Specifications, 2024 NOTE: Method of Measurement or Basis of Payment included in Standard Specifications do NOT apply.

1.3 SUBMITTALS

A. All drainage structures shall be certified by manufacturer in meeting the ASTM and AASHTO specifications.
1. Product Data will be required for both inlet grate and inlet frame used in constructing drainage structures.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Protect end sections from dirt and damage.

B. Particular care shall be taken to protect end sections. Handling equipment and procedures shall be in accordance with the approved manufacturer's recommendation for proper handling of his products. Improper handling of drainage structures that damage them will be rejected for installation.

PART 2 - PRODUCTS

2.1 REINFORCED CONCRETE PIPE END SECTION

A. Flared End Sections shall comply with MoDOT specification section 1032.

B. All reinforced concrete pipe and flared end sections shall be in accordance with AASHTO M 170.

C. Joints shall be in accordance with manufacturers product data.

2.2 STEEL PIPE END SECTION

A. Corrugated-Steel Pipe and Fittings: ASTM A 760, Type I with fittings of similar form and construction as pipe.

1. Standard-Joint Bands: Corrugated steel.

2. Coating: Zinc.

A. Flared End Sections shall comply with MoDOT specification section 1020.

B. Corrugated-Steel End Sections shall be used if HDPE pipe is utilized. HDPE end sections will not be allowed.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavation, trenching, and backfilling are specified in Division 31 Section 31 2300 "Excavation and Fill."

3.2 INSTALLATION

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of storm drainage structures. Location and arrangement of structures take into account design considerations. Install structures as indicated, to extent practical. Where specific installation is not indicated, follow manufacturer's written instructions.

3.3 STORMWATER INLET AND OUTLET INSTALLATION

A. Construct riprap of broken stone, as indicated. Refer to Division 31 Section 31 3716.13 "Rubble-Stone Riprap."

B. Install outlets that spill onto grade, with flared end, where indicated.

3.4 TOE WALLS

A. All end sections, including upstream end, shall have concrete toe walls or steel toe plates as shown on 732.000 in MoDOT Standard Plans for Highway Construction.

END OF SECTION 33 4900

APPENDICES

Appendix 1

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/.

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

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, APPLICABILTY, Condition A.4. Support activities which discharge process water shall apply for separate coverage (e.g.,a concrete batch plant discharging process water shall be covered under a MOG49).

4. This permit authorizes non-stormwater discharges associated with your construction activity from the following activities provided that these discharges are treated by appropriate Best Management Practices (BMPs) where applicable and addressed in the permittee's site specific SWPPP required by this general permit:
   (a) Discharges from emergency fire-fighting activities;
   (b) Hydrant flushing and water line flushing, provided the discharged water is managed to avoid instream water quality impacts;
   (c) Landscape watering, including to establish vegetation;
   (d) Water used to control dust;
   (e) Waters used to rinse vehicles and equipment, provided there is no discharge of soaps, solvents, or detergents used for such purposes;
   (f) External building washdown, provided soaps, solvents, and detergents are not used, and external surfaces do not contain hazardous substances (e.g., paint or caulk containing polychlorinated biphenyls (PCBs))
   (g) Pavement wash waters, provided spills or leaks of toxic or hazardous substances have not occurred (unless all spill material has been removed) and where soaps, solvents, and detergents are not used. Directing pavement wash waters directly into any water of the state, storm drain inlet, or stormwater conveyance (constructed or natural site drainage features), unless the conveyance is connected to an effective control, is prohibited;
   (h) Uncontaminated air conditioning or compressor condensate;
   (i) Uncontaminated, non-turbid discharges of ground water or spring water;
   (j) Foundation or footing drains where flows are not contaminated with process materials; and
   (k) Uncontaminated construction dewatering water discharged in accordance with requirements found in this permit for specific dewatering activities.

B. Permit Restrictions and Limitations

1. This permit does not authorize the discharge of process wastewaters, treated or otherwise.

2. For sites operating within the watershed of any Outstanding National Resource Water (which includes the Ozark National Riverways and the National Wild and Scenic Rivers System), sites that discharge to an Outstanding State Resource Water, or facilities located within the watershed of an impaired water as designated in the Clean Water Act (CWA) Section 303(d) list with an impairment for sedimentation/siltation:
   (a) This permit authorizes stormwater discharge provided no degradation of water quality occurs due to discharges from the permitted facility per 10 CSR 20-7.031(3)(C).
   (b) A site with a discharge found to be causing degradation or contributing to an impairment by discharging a pollutant of concern, during an inspection or through complaint investigations, may be required to become a no discharge facility or obtain a site-specific permit with more stringent monitoring and SWPPP requirements.

3. This permit does not allow placement of fill material into any stream or wetland, alteration of a stream channel, or obstruction of stream flow unless the appropriate CWA Section 404 permitting authority provides approval for such actions or determines such actions are exempt from Section 404 jurisdiction. Additionally, this permit does not authorize placement of fill in floodplains unless approved or determined exempt by appropriate federal and/or state floodplain development authorities.

4. This operating permit does not affect, remove, or replace any requirement of the National Environmental Policy Act; the Endangered Species Act; the National Historic Preservation Act; the Comprehensive Environmental Response, Compensation and Liability Act; the Resource Conservation and Recovery Act; or any other relevant acts. Determination of applicability to the above mentioned acts is the responsibility of the permittee. Additionally, this permit does not establish terms and conditions for runoff resulting from silvicultural activities listed in Section 402(l)(3)(a) of the Clean Water Act.

5. Compliance with all requirements in this permit does not supersede any requirement for obtaining project approval from an established local authority nor remove liability for compliance with county and other local ordinances.

6. The Department may require any facility or site authorized by a general permit to apply for a site-specific permit [10 CSR 20-6.010(13)(C)].

7. If a facility or site covered under a current general permit desires to apply for a site-specific permit, the facility or site may do so by contacting the Department for application requirements and procedures.

8. Any discharges not expressly authorized in this permit and not clearly disclosed in the permit application cannot become authorized or shielded from liability under CWA section 402(k) or Section 644.051.16, RSMo, by disclosure to EPA, state, or local authorities after issuance of this permit via any means, including any other permit applications, funding applications, the SWPPP, discharge monitoring reporting, or during an inspection. Discharges at the facility not expressly authorized by this permit must be covered by another permit, be exempt from permitting, or be authorized through some other method.

II. EXEMPTIONS FROM PERMIT REQUIREMENTS

1. Sites that discharge all stormwater runoff directly to a combined sewer system (as defined in 40 CFR 122.26 and 40 CFR 35.2005) connecting to a publicly owned treatment works which has consented to receive such a discharge are exempt from Department stormwater permit requirements.

2. Land disturbance activities that disturb less than one (1) acre of total land area which are not part of a common plan or sale where water quality standards are not exceeded are exempt from Department stormwater permit requirements.

3. Oil and gas related activities as listed in 40 CFR 122.26(a)(2)(ii) where water quality standards are not exceeded are exempt from Department stormwater permit requirements.

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

III. REQUIREMENTS

1. The permittee shall post a public notification sign at the main entrance to the site, or a publically visible location, with the specific MOR100 permit number. The public notification sign must be visible from the public road that provides access to the site's main entrance. An alternate location is acceptable provided the public can see it and it is noted in the SWPPP. The public notification sign must remain posted at the site until the site is finalized.

2. The permittee shall be responsible for notifying the land owner and each contractor or entity (including utility crews and city employees or their agents) who will perform work at the site of the existence of the SWPPP and what actions or precautions shall be taken while on site to minimize the potential for erosion and the potential for damaging any BMP. The permittee is responsible for any damage a subcontractor may do to established BMPs and any subsequent water quality violation resulting from the damage.

3. Ensure the design, installation, and maintenance of effective erosion and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed, and maintained to:
   (a) Control stormwater volume, velocity, and peak flow rates to minimize soil erosion;
   (b) Control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion and scour;
   (c) Minimize the amount of exposed soil during construction activity;
   (d) Minimize the disturbance of steep slopes;
   (e) Minimize sediment discharges from the site. Address factors such as:
      1) The amount, frequency, intensity, and duration of precipitation;
      2) The nature of resulting stormwater runoff;
      3) Expected flow from impervious surfaces, slopes, and drainage features; and
      4) Soil characteristics, including the range of soil particle size expected to be present on the site.
   (f) Provide and maintain natural buffers around surface waters as detailed in Part V. BMP REQUIREMENTS Condition 7, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration and filtering, unless infeasible; and
   (g) Minimize soil compaction and preserve topsoil where practicable.

   A 2-year, 24-hour storm event can be determined for the project location using the National Oceanic and Atmospheric Administration's National Weather Service Atlas 14 which can be located at https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html, 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:

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

1-800-361-4827

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FACT SHEET FOR MASTER GENERAL PERMIT
MO-R100XXX

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

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

DEFINITIONS FOR THE PURPOSES OF THIS PERMIT:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

PART I – BASIC PERMIT INFORMATION

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

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

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

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

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

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

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

PART II – RECEIVING STREAM INFORMATION

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

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

Missouri Water Quality Standards (10 CSR 20-7.031) defines the Clean Water Commission water quality objectives in terms of "water uses to be maintained and the criteria to protect those uses." The receiving stream and/or 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_table.htm; to calculate peak discharges, the website https://www.lmnoeng.com/Hydrology/rational.php has the rational equation to calculate expected discharge volume from the peak storm events.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):
In accordance with 40 CFR 122.44(k), BMPs must be used to control or abate the discharge of pollutants when: 1) Authorized under section 304(e) of the CWA for the control of toxic pollutants and hazardous substances from ancillary industrial activities; 2) Authorized under section 402(p) of the CWA for the control of stormwater discharges; 3) Numeric effluent limitations are infeasible; or 4) the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA. In accordance with the EPA's *Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites,* (Document number EPA 833-R-06-004) published by the EPA in 2007 https://www.epa.gov/sites/production/files/2015-10/documents/sw_swppp_guide.pdf, 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 2

Storm Water Pollution Prevention Plan (SWPPP)

for

X2328-01
Vehicular Bridge & Pedestrian Trail

in
Bennett Spring State Park, Laclede County, Missouri

Prepared by:
Bartlett & West
March 13, 2025

Table of Contents

I. Introduction

A. General

The State of Missouri is delegated by the U.S. Environmental Protection Agency (EPA) to administer the National Pollutant Discharge Elimination System (NPDES) general permit for construction activities within the state that disturb more than one acre or more. A Missouri State Operating Permit for storm water discharges is required in accordance with Missouri Regulations 10 CSR 20-6.200. The Missouri Department of Natural Resources issued general operating permit number MO-R100038 on August 1, 2022, to the Missouri Office of Administration. This permit is applicable for and applies to all construction or land disturbance activity that is performed by or under contract to the City of Columbia, Missouri. All construction activities performed in relation to this project shall be done so in accordance with general operating permit number MO-R100038.

This document comprises the Storm Water Pollution Prevention Plan (SWPPP) required by the general operating permit number MO-R100038. This SWPPP establishes a plan to manage the quality of storm water runoff from construction activities associated with this construction project. The Contractor shall comply with all aspects of this document as well as all the conditions and requirements of general operating permit number MO-R100038. A copy of the general operating permit number MO-R100038 is contained in the appendices.

B. Contact Information/Responsible Parties

Contractor:
Company Name:
Company Representative:
Address:

Telephone Number:
Fax Number:
E-mail:

Emergency 24-Hour Contact:
Name:
Telephone Number:
Company Name:

Subcontractor:
Company Name:
Company Representative:
Address:

Telephone Number:
Fax Number:
E-mail:

Subcontractor:
Company Name:
Company Representative:
Address:

Telephone Number:
Fax Number:
E-mail:

Person Responsible for BMP Maintenance
Name:
Phone:
E-mail:

Construction Foreman
Name:
Phone:
E-mail:

SWPPP Preparation
Neil Brady, PE
Bartlett & West
417.429.0611
neil.brady@bartwest.com

C. Notification to All Contractors

Each contractor or entity (including utility crews and city employees or their agents) who will be performing work at the site shall be notified of the existence of the SWPPP and what action(s) or precaution(s) shall be taken while on-site to minimize the potential for erosion and the potential for damaging any BMP. Any additional land that is disturbed, beyond the limits of disturbance shown on the plans, or BMP damaged, shall be repaired.

D. Retention of Records

The contractor must maintain a copy of this SWPPP on the construction site and at their office from the date of the project initiation to the date of final stabilization.

II. Site and Project Information

A. Location

Location Description:

The project is located in Bennett Spring State Park, in Laclede County, MO.

Section Township and Range:

S31 T35N R17W
S36 T35N R18W

Latitude and Longitude

South terminus Lat 37°43'32"N, Long 92°51'20"W
North terminus Lat 37°44'01"N, Long 92°51'36"W

B. Project Description

General

The project consists of an offset 2-lane vehicular bridge and roadway work. The project also consists of approximately 170 lineal feet of 5'-0" wide gravel trail, 50 lineal feet of 6' wide concrete sidewalk, and 3500 lineal feet of 10'-0" wide concrete multi-use trail. The multi-use trail will include several roadway and driveway crossings. The sidewalk/multi-use trail will begin at the Bennett Spring State Park Store and run north, terminating at the existing Bramwell Bridge within the state park. All earthwork will be graded to a maximum of 3:1 slope (3 horizontal to 1 vertical) in cut and fill areas. The existing terrain is relatively flat. Maximum earth fills and cuts will be approximately 15 feet.

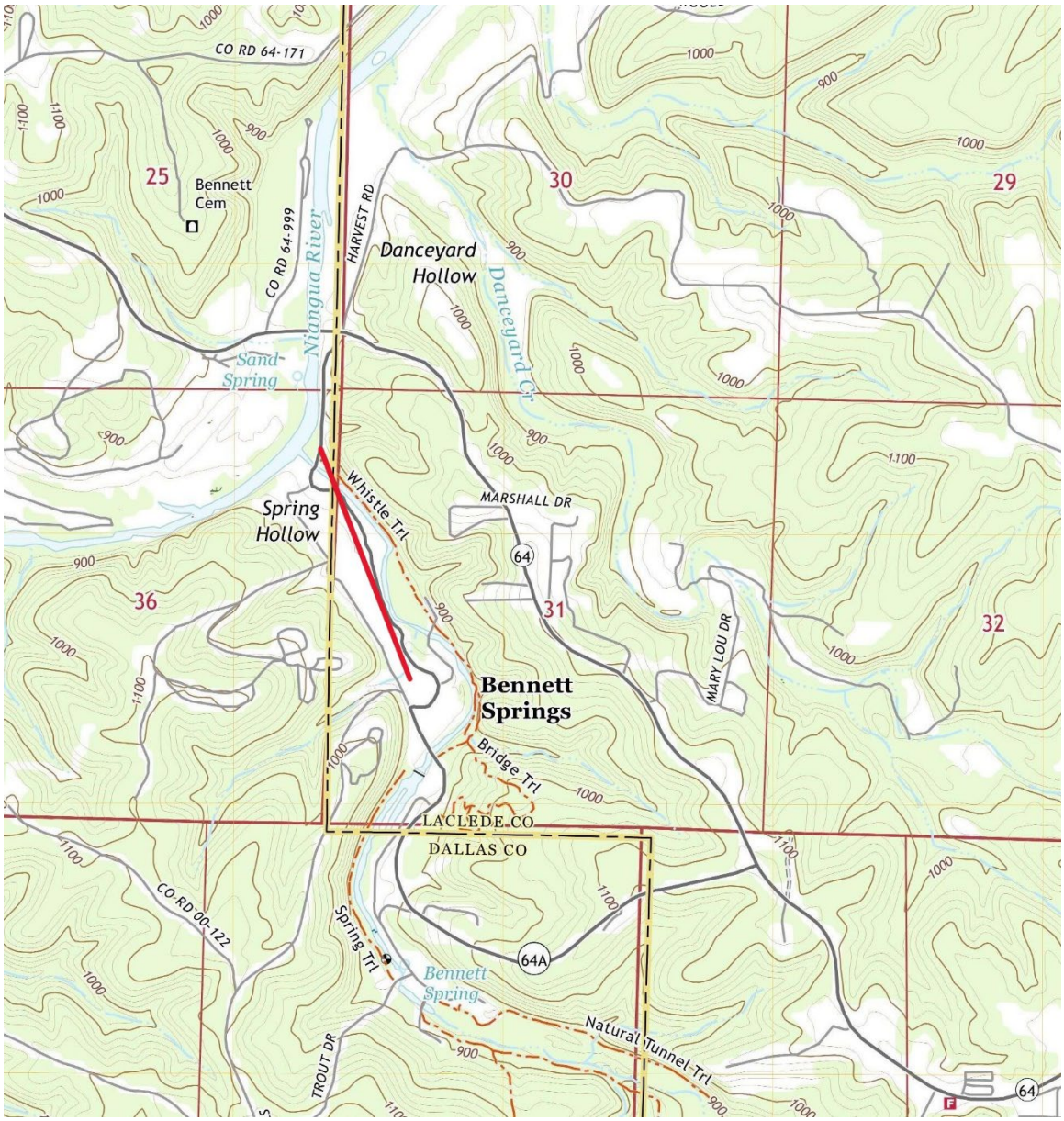
Amount of Disturbance

All of the area within grading limits will be disturbed. Some areas beyond that may be disturbed by construction activities, but disturbance will not allow tree removal/damage beyond the defined grading limits. The disturbance limits for this project total approximately 5 acres.

Construction Support

The project will be staged on State Park property. All staging areas are to be coordinated and approved by the State Park Staff.

C. Site Map



D. Receiving Waters

The receiving waterbody for this project is the Niangua River and its tributaries.

III. Sequence of Construction

Contractor to complete this section noting the sequencing and expected dates of beginning and completing the various tasks need to build the trail and submit this to the Inspector before Notice to Proceed. The first task should be to prepare the sediment control measures to meet the plans and specifications.

IV. Best Management Practices

A. General

To ensure that this project does not promote erosion, siltation, or drainage problems, erosion best management practices (BMPs) are to be implemented at this project site. Soil erosion and sediment controls are measures that are used to reduce the amount of soil particles that are carried off of a land area and deposited in receiving water. This section provides a general description of the most appropriate measures planned for this project. All applicable soil erosion and sediment control measures shall be implemented in accordance with the guidelines contained herein prior to commencement of field construction activities. Measures shall be maintained during and after the construction activity until final stabilization is accomplished. Upon successful re-vegetation of the disturbed area, all temporary soil erosion and sediment control measures shall be removed. Appropriate impediments for storm water discharge will be implemented, and benchmarks referenced for proper installation, operation and maintenance of drainage courses.

BMPs shall be provided around any stockpile areas.

BMPs should be field modified to accomplish the desired results.

B. Selection

The BMPs for this project are:

- Erosion Control Mats
- Permanent Turf Reinforcement Mats
- Silt Fence
- Rock Blanket at Storm Pipe/Culvert Outlets
- Prompt Fertilizing, Seeding, and Mulching
- Rock Ditch Check

A detailed description of each BMP is contained in Appendix A. The detailed description of each BMP includes the conditions required for its effective use, installation notes, and inspection and maintenance requirements as applicable.

Locations of all BMPs are shown on the Erosion Control Plans or elsewhere on the construction plans. Those not shown in the plans are included in the event they are required due to unanticipated conditions during construction.

C. Disturbed Areas

BMPs should be installed at disturbed locations at the end of each day where practical.

Where soil disturbing activities halt in an area for more than 14 days, the disturbed area shall be protected from erosion by stabilizing the area with mulch or other similarly effective BMP.

If the slope of an area is greater than 3:1, or greater than 3% and greater than 150 feet in length; the disturbed area shall be protected from erosion by stabilizing the area with mulch, or another similarly effective BMP, if the activity ceases for more than 7 days. The requirement does not apply to sedimentary basins or areas that drain hereto.

The maximum time any area of the site will be left denuded is 6 months. Completed areas shall be seeded before grading begins for the next phase.

D. Perimeter BMP Installation

Perimeter or border BMPs shall be installed and marked for preservation prior to general site clearing. Storm water discharging from areas affected by construction shall pass through sediment control measures as shown on the plans.

E. Temporary and Permanent Non-Structural BMPs

Temporary and Permanent Non-Structural BMPs consist of protection of existing vegetation or trees, mulching, sodding, seeding, geotextiles, stabilization and stabilized site accesses. Permanent stabilization (groundcover) practices will be properly implemented within 30 days of final construction. Final seeding and mulching of disturbed areas shall in accordance with the “Seeding And Mulching” specification in the contract documents.

Temporary and Permanent Non-Structural BMPs shall be implemented as shown on the plans. Any existing vegetation shall be preserved where practical. Disturbed areas shall be without vegetative cover for the minimum duration as practical.

F. Temporary and Permanent Structural BMPs

Temporary and Permanent Structural BMPs consists of silt fences, check dams, diversion dikes, drainage swales, sediment traps, and sediment basins. Temporary and Permanent Structural BMPs shall be implemented as shown on the drawings.

G. Maintenance

All erosion and sediment control devices shall be properly maintained at all times . All temporary BMPs shall be left in place and be maintained until the site is permanently stabilized with vegetation (at least 70 percent cover). Following the completion of construction and planting activities, the construction inspector shall conduct periodic site reviews to ensure that vegetation establishment is satisfactory. If vegetation cover is not adequate, special steps to correct problems shall be implemented, such as re-seeding, mulching, sodding, or the use of erosion control blankets.

H. Dewatering

Dewatering methods shall include pumps. The water shall be discharged upstream of erosion control BMPs designed to treat water pumped from excavations prior to leaving the site. In no case shall this water be pumped off site without being treated by the specified BMPs. The Contractor is responsible for implementing these procedures. These measures shall be inspected during routine SWPPP inspections if applicable.

V. Site Inspection

A. General

All erosion and sediment control devices shall be properly maintained at all times and inspected: 1) every 7 days; and 2) within 48 hours after a storm event that causes stormwater runoff to occur on the site. A good faith effort will be made to inspect erosion and sediment control devices within 24 hours of a rainfall event that occurs Monday through Thursday.

Any deficiencies noted during an inspection shall be reported to the contractor within 24 hours of identification so that they may be repaired in an efficient manner, and shall be corrected within 7 calendar days of that inspection.

If inspection results indicate a need for revision to the SWPPP, the plan shall be revised and implemented as appropriate, within seven calendar days following the inspection.

B. Site Inspection Reports

Findings of these inspections shall be recorded on a BMP Inspection Report. The inspection reports shall identify any incidents of non-compliance. All inspection reports

shall be retained at the Office of Administration offices and shall be available for review during normal business hours. These reports shall be retained for a period of at least three years from the Letter of Termination date.

A copy of the BMP Inspection Report form to be used is attached and shall be reproduced and used as needed for individual inspections. All inspections shall be recorded and signed by the inspector.

BMP Inspection Report

Owner: _____ **Date:** _____

Project Name: _____ **Project No:** _____

Contractor: _____ **Job Superintendent:** _____

Observer's Name: _____

Today's Weather: _____ Temp _____ °F Other _____

Previous Precipitation: Rain _____ Snow_____ Sleet _____ Other_____

Describe Precipitation/Runoff: _____

_____

_____

Observations of BMP Effectiveness: _____

_____

_____

_____

Actions Taken to Correct Deficiencies: _____

_____

_____

_____

List Areas where Land Disturbance has Stopped: _____

_____

_____

Other Recommendations/Discussions with Contractor: _____

_____

_____

_____

Other Discharges (i.e.: Hazardous Substances, Oil, Etc.): _____

_____

_____

OBSERVERS SIGNATURE: _____

VI. Amending/Updating the SWPPP

The SWPPP shall be amended and updated whenever:

- design, operation or maintenance of BMPs is changed,
- design of the construction project is changed that could significantly affect the quality of the storm water discharges,
- inspections indicate deficiencies in the SWPPP or any BMP,
- any notifications from MDNR of deficiencies in the SWPPP,
- SWPPP is determined to be ineffective in significantly minimizing or controlling erosion and sedimentation (e.g., there is visual evidence, such as excessive site erosion or excessive sediment deposits in streams or lakes),
- Total Settleable Solids from a storm water outfall exceeds 2.5 ml/L/hr,
- MDNR determines violations or Water Quality Standards may occur or have occurred.

VII. Pollution Prevention Controls

A. Solid Waste Disposal

The general contractor is responsible for disposing of all solid waste from the site in accordance with state law. Solid waste facilities shall be provided on the site. An adequate number of trash containers shall be located to provide access to all trades. The site shall remain in an orderly condition. All waste material shall be collected daily and stored in a secure container or removed from the project site. The waste container will be inspected regularly with contents disposed properly by the contractor. No waste oil or other petroleum-based products will be disposed of on site (e.g. buried, poured, etc.); but shall be taken off-site for proper disposal.

B. Sanitary Waste

All sanitary waste will be collected from portable units as required and properly disposed of off-site in compliance with local and state regulations.

C. Off-Site Vehicle Tracking

Public roads that provide access to the right-of-way will be monitored for any tracking of sediments (mud, etc.) from the site onto the road as follows:

1) Weekly during dry periods, and
2) Daily after rainfall events that leave the project area wet and construction activity is proceeding.

D. Concrete Waste

Concrete wash or rinse water from ready-mix trucks, concrete mixing equipment, tools, etc. may not be discharged into or be allowed to run directly into any existing waterbody or storm inlet. One or more locations for concrete washout will be designated on site, such that discharges during concrete washout will be contained in a small area where waste concrete can solidify in place and excess water is evaporated or infiltrated into the ground.

E. Hazardous Waste

All fueling facilities present on all sites shall adhere to applicable federal and state regulations concerning underground storage, above ground storage, and dispensers, including spill prevention, control and counter measures.

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

All paints, solvents, petroleum products and petroleum waste products (except fuels) and storage containers (such as drums, cans or cartons) shall be stored so that these materials are not exposed to storm water. Sufficient practices of spill prevention, control and/or management shall be provided to prevent any spills of these pollutants from entering a water of the state. Any containment system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall also prevent the contamination of groundwater.

The applicant shall notify by telephone and in writing the Department of Natural Resources, water Pollution Control Program, Post Office Box 176, Jefferson City, MO 65102, 1-800-361-4827, of any oil spills or if hazardous substances are found during the prosecution of work under this permit.

F. Spill Prevention and Control Plan

The Spill Prevention and Control Plan (SPCP) describes measures to prevent, control, and minimize impacts from a spill of a hazardous, toxic, or petroleum substance during construction of the proposed project in the State of Missouri. This plan identifies the potentially hazardous materials to be used during this project; describes transport, storage, and disposal procedures for these substances; and outlines procedures to be followed in the event of a spill of a contaminating or toxic substance.

1. Material Management Practices

Properly managing these materials on the construction site will greatly reduce the potential for storm water pollution of these materials. Good housekeeping along with proper use and storage of these construction materials form the basis for proper management of potentially hazardous material.

The proper use of materials and equipment along with the use of general common sense greatly reduces the potential for contaminating storm water runoff. The following is a list of good housekeeping practices to be used during the construction project:

- Storage of hazardous materials: chemical fuels and oils, and fueling of construction equipment, shall not be performed within 100 feet of any stream bank, wetland, water supply well, spring, or other water body.
- Contractor and contractor's employees shall be properly trained in handling materials used and/or kept at the job site.
- Contractor and contractor's employees shall have proper access to all necessary safety items.
- Trash containers will be provided for waste disposal and regular site clean-up will be conducted.
- An effort will be made to store only enough product required to do the job.
- Materials stored on the site will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure.
- Products will be kept in their original containers with the original manufacture's label.
- Substances will not be mixed with one another unless recommended by manufacturer.
- Whenever possible, all of the product will be used before disposing of the container.
- Manufacturer's recommendations for proper use and disposal of a product will be followed.
- If surplus product must be disposed of, manufactures or local and state recommended methods for proper disposal will be followed.
- When possible, materials should be stored with secondary containment and in a covered structure such as a building or job trailer.

2. Product Specific Practices

Due to the chemical makeup of specific products, certain handling and storage procedures are required to promote the safety of handlers and prevent the possibility of pollution. Care shall be taken to follow all directions and warning for products used on the site. All pertinent information can be found on the Material Safety Data Sheets (MSDS) for each product. The MSDS sheets should be located with each product container they represent. Several product-specific practices are listed in the following sections.

a. Petroleum Products

All fueling facilities present on the job site shall adhere to applicable federal and state regulations concerning underground storage, above ground storage and dispensers, including spill prevention, control and counter measures.

On-site vehicles will be monitored for leaks and receive regular maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed clearly labeled containers. Preferably the containers will be stored in a covered truck or trailer that provides secondary containment for the products.

Bulk storage tanks having a capacity of greater than 55 gallons will be provided with secondary containment. Containment can be provided by a temporary earthen berm or other means. After each rainfall, the contents of the secondary containment area will be inspected by the contractor. If there is no visible sheen on the collected water, it will be pumped around in a manner that does not cause scouring. If a sheen is present, it must be cleaned up prior to discharging the water.

Bulk fuel or lubricating oil dispensers shall have a valve that must be held open to allow the flow of the fluid. During fueling operations, the contractor shall have personnel present to detect and contain spills.

b. Fertilizers

Fertilizers shall be applied to stimulate vegetation growth as recommended by the manufacturer and in accordance with the contract documents. Once applied, the fertilizer shall be worked into the soil to limit the exposure to storm water.

3. Spill Control and Cleanup

In addition to the best management procedures discussed previously, the following spill control and cleanup practices will be followed to prevent storm water pollution in the event of a spill:

- Spills will be contained and cleaned up immediately after discovery.
- Manufacturers' methods for spill cleanup of a material will be followed as described on the material's MSDS.
- Materials and equipment needed for cleanup procedures will be kept readily available on the site, either at an equipment storage area or on contractor's trucks. Equipment to be kept on the site will include but not be limited to brooms, dust pans, shovels, granular absorbents, sand, saw dust, absorbent pads and booms, plastic and metal trash containers, gloves and goggles.

- Personnel on site will be made aware of cleanup procedures and the location of spill cleanup equipment.
- Toxic, hazardous, or petroleum product spills required to be reported by regulation will be documented to the appropriate federal, state and local agencies.
- Spills will be documented and a record of the spills will be kept with this SWPPP.

If a spill occurs that is reportable to the federal, state or local agencies, the contractor is responsible for making the notifications.

The federal reportable spill quantity for petroleum products is defined in 40 CFR 11.0 as any oil spill that:

- Violates applicable water quality standards.
- Causes a film or sheen upon or discoloration of the water surface or adjoining shoreline.
- Causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines.

A reportable spill for this project shall be defined as the discharge of 50 gallons or more of a petroleum product into the environment. It is the responsibility of the contractor to comply with the most current spill control and cleanup regulations.

The federal reportable spill quantities for hazardous materials are listed in 40 CFR, Part 302.4 in the table entitled: List of Hazardous Substances and Reportable Quantities." A procedure for determining a reportable spill is outlined below.

If a reportable spill occurs, a modification to the SWPPP must be made within 14 days. The modification shall include; a description of the release, the date of the release; an explanation of why the spill happened; a description of procedures to prevent future spills from happening; and a description or response procedures should a spill or release occur again and within 14 days of the release. A written description of the release must be submitted to the City by the Contractor that includes; a description of the release, including the type of material and an estimated amount of spill; the date of the spill; an explanation of why the spill occurred; and a description of the steps taken to prevent and control future spills. These modifications to the SWPPP must be made by the Contractor and will be documented.

4. Procedures for Determining if a Hazardous Material Spill is a Reportable Quantity

1. First determine the type and quantity of material that has been spilled.

2. Obtain a material safety data sheet (MSDS) for the spilled material and determine whether any of the constituents are listed in Table 302.4 in 40 CFR 302 (Code of Federation Regulations).

3. If none of the constituents in the spilled material are listed in the table (excluding ethylene glycol), the spill is not reportable.

4. If the constituents in the spilled material are listed in the table, use the following equation to determine the pounds of material spilled:

   Pounds Spilled = (V)(Wt%)(Sg)(0.0834)

   Where:

   V = Volume of the material spilled, in gallons

   Wt% = The weight percent of the constituents in the spilled material (see the MSDS)

   Sg = Specific gravity of spilled material (see MSDS)

5. If based on the calculation, the pounds spilled are Greater than the Final RQ (reportable quantity) value listed in Table 302.4 in 40 CFR 302 or the State's reportable quantity minimum amount, the spill must be reported to the appropriate federal, state, and local agencies.

Spill Report Form

(1 of 2)

Project/Site: _____

Spill Reported By: _____ **Phone** _____

Date Reported: _____ **Time:** _____

Date of Spill: _____ **Time:** _____

Name of Facility: _____

Legal Description: 1/4 _____ 1/4_____ 1/4 SEC_____,TWP_____ ,Range_____

County _____

Describe Spill Location and Events Leading to Spill: _____

_____

_____

_____

_____

Material Spilled: _____

Source of Spill: _____

Amount Spilled (Gallons or Pounds)**:** _____

Amount Spilled to Waterway (Gallons or Pounds)**:** _____

Nearest Municipality: _____

Containment or Cleanup Action: _____

_____

_____

List Environmental Damage (fish kill, etc)**:** _____

_____

_____

List Injuries or Personal Contamination: _____

_____

_____

Date and Time Cleanup Completed or Terminated _____

Spill Report Form

(2 of 2)

If Cleanup Delayed:

Nature and Duration of Delay: _____

Description of Materials Contaminated: _____

_____

_____

Approximate Depth of Soil Excavation: _____

Action to be taken to Prevent Future Spills: _____

_____

_____

_____

Agencies Notified:

Local: _____ **Date:** _____

State: _____ **Date:** _____

Federal: _____ **Date:** _____

Signed: _____

Contactor Superintendent or
Environmental Inspector

VIII. Permanent Storm Water Management

The permanent storm water management plan for this site includes the following:

- By establishing vegetative growth within the disturbed areas, the amount of silt laden runoff will be greatly reduced among the areas of low concentrated flows.

- All outfalls have an apron constructed of riprap to prevent scour and minimize the potential for downstream erosion by reducing the velocity and energy of concentrated storm water flows.

Appendix A

Best Management Practices

Table of Contents

Land Grading

Description

Reshaping the ground surface to provide suitable topography for buildings, facilities and other land uses, to control surface runoff, and to minimize soil erosion and sedimentation both during and after construction.

Installation

When - Existing topography must be modified to prepare for another land use.

Where – Adapting proposed development to the existing landscape can reduce the erosion potential of the site and the cost of installing erosion and sedimentation control measures.

How -

- Determine exact location of underground utilities.
- Remove and stockpile topsoil if subsoils will not support plant growth.
- Clear and grub areas to be filled to remove trees, vegetation, roots and other debris.
- Check fill to make sure it does not contain brush, rubbish, oversized rocks or other objectionable material.
- Place fill in layers and compact as specified by the grading plan. Do not use material that is frozen, excessively soft or has high organic content.
- Do not place fill on frozen subgrade.
- Construct slope breaks as shown on the grading plan.

Guidelines for Spacing Slope Breaks

Slope	Spacing (ft)
33-50%	20
25-33%	40
15-25%	60
10-15%	80
6-10%	120
3-6%	200
<3%	300

Source: Adapted from North Carolina Field Manual, 1991

- Permanently stabilize graded areas immediately after final grading is completed. Use temporary stabilization measures on graded areas when work is to be interrupted or delayed for 30 working days or longer.

- Avoid disturbing natural drainageways, if possible. At each slope break, intercept runoff and channel to storm drains or stabilized watercourses. If runoff is laden with sediment, protect drain inlets with a filter or divert water to a sediment trap or basin according to the site grading plan.

- Graded areas should be stabilized with mulch, vegetation, crushed stone, riprap or other measures as soon as work is completed, or if work is interrupted for 30 or more working days.

- Slopes to be vegetated should be 2:1 or flatter; 3:1 or flatter where maintained by tractor or other equipment. Slopes should be roughened during grading operations to retain water, increase infiltration and promote vegetative growth. Slope should be protected from surface runoff while vegetation is being established.

- Borrow and disposal areas should be no closer than 50 feet to a streambank in the absence of a specification.

- Stable channels and waterways should be provided for runoff from the disturbed areas to retain sediment on site.

Operation and Maintenance

Periodically check all graded areas and the related erosion and sedimentation control practices, especially after heavy rainfalls. Clean sediment out of diversions and other structures as needed. If washouts or breaks occur, repair them immediately.

Mulching

Description

Mulching is a temporary soil stabilization or erosion control practice where materials such as grass, hay, woodchips, wood fibers, straw, or gravel are placed on the soil surface. In addition to stabilizing soils, mulching can reduce the speed of storm water runoff over an area. When used together with seeding or planting, mulching can aid in plant growth by holding the seeds, fertilizers, and topsoil in place, by helping to retain moisture, and by insulating against extreme temperatures.

Installation

When - Mulching is often used alone in areas where temporary seeding cannot be used because of the season or climate. Mulching can provide immediate, effective, and inexpensive erosion control. On steep slopes and critical areas such as waterways, mulch matting is used with netting or anchoring to hold it in place.

Where - Mulch seeded and planted areas where slopes are steeper than 2:1, where runoff is flowing across the area, or when seedlings need protection from bad weather.

How -

1. Spread straw or cereal grain mulch uniformly over the area with a power blower, hydroseeder or by hand. No more than 25% of the ground surface should be visible after spreading.

2. Apply at the rates shown in the table below. Use higher rates for steep slopes, channels and other erosive areas.

3. Anchor straw or wood cellulose mulch by one of the following methods:

    - Crimp with a weighted, straight, notched disc or a mulch anchoring tool to punch the straw into the soil.

    - Tack with a liquid tackifier designed to hold mulch in place.

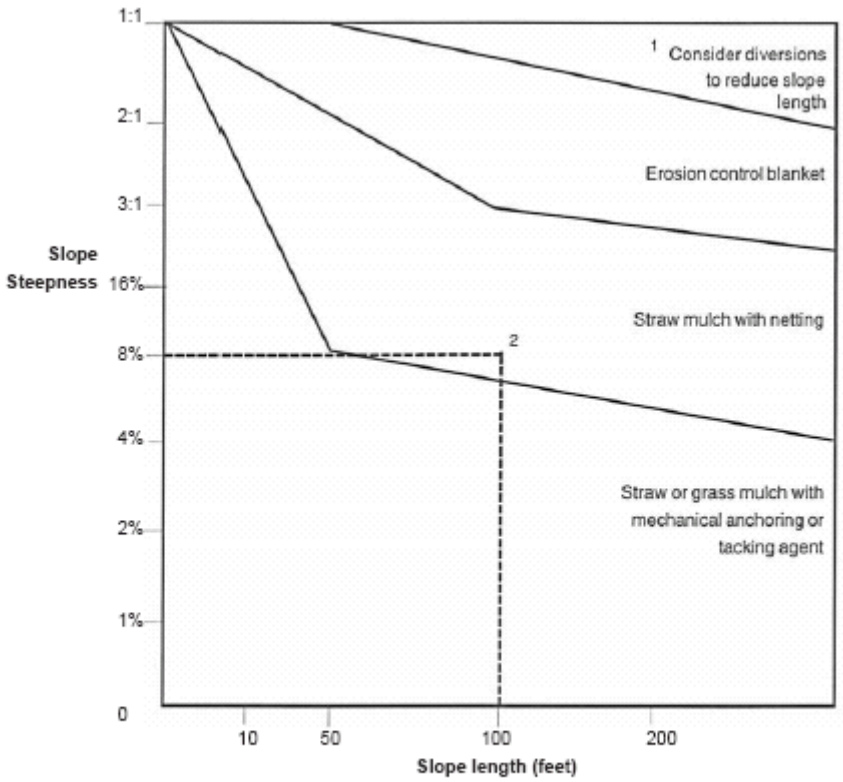
    - Use suitable spray equipment and follow manufacturer's recommendations.

    - Cover with netting, using a degradable natural or synthetic mesh to hold mulch materials in more erosive areas. The netting should be anchored according to manufacturer's specifications

Typical Mulching Material and Application Rates

	Material	Rate per Acre	Requirements	Installation/Uses
Organic Mulches:	Straw	1 1/2 - 2 1/2 tons	Dry, unchopped, unweathered; free of weed seeds and rot;	Spread by hand or machine 1.5 to 2.5 inches deep; must be tacked or tied down.
	Wood fiber, wood cellulose, recycled newsprint, bonded fiber matrix	1 - 2 tons	Double the application rate for erosion control on critical areas	Use with power mulcher or hydroseeder; may be used to tack straw on steep slopes. Do not use in hot, dry weather.
	Wood chips	10 - 20 tons	Air dry. Add Nitrogen fertilizer, 20 to 25 lbs of N/ton of mulch	Apply with blower, chip handler or by hand. Not for fine turf areas. Most effective around trees and shrubs. Not recommended for mowed areas.
	Bark	35 yd^3	Air dry, shredded or hammermilled or chips. Add Nitrogen fertilizer, 20 to 25 lbs of N/ton of mulch	Apply with mulch blower, chip handler or by hand. Do not use asphalt tack. Resistant to wind blowing. Most effective around trees and shrubs. Not recommended for mowed areas.
Nets, Mats and Roving:	Netting	Cover area	Uniform natural or synthetic netting. Used with or without organic mulch, depending on product.	Withstands water flow. Must be anchored.
	Erosion control mats/blankets	Cover area	Use without additional mulch.	Suitable for steep areas and areas with concentrated water flow. Must be anchored with good blanket-to-soil contact.
	Fiberglass roving	1/2 - 1 ton	Continuous fibers of drawn glass bound together with a nontoxic agent. Use with organic mulch.	Apply with compressed air ejector. Tack with emulsified asphalt at rate of 25 - 35 gal/1000 ft^2.
Tackifiers	Mulch Tackifiers: Many commercial products	Follow manufacturer's specifications	Biodegradable powders, water dispersable.	Use to hold mulch on steep or wet areas. Apply with suitable spray equipment at manufacturer's recommended rate.
Soil Binders:	Chemical Stabilizers: Many Trade Names	Follow manufacturer's specifications.	Use for temporary stabilization of soil.	Not beneficial to plant growth. Do not attempt to seed/mulch over the soil binder.

Source: adapted from North Carolina Field Manual, 1991



1 For slopes steeper than 1:1, consider building a diversion above slope to divert water.
2 Example: An 8% slope 100' long requires a straw mulch with netting.

General Mulch Recommendations to Protect from Splash and Sheet Flow

Source: Adapted from Minnesota
"Protecting Water Quality in Urban Areas," 1991

Operation and Maintenance

Inspect all mulched areas periodically and after rainstorms for erosion and damage to the mulch. Repair promptly and restore to original condition. Continue inspections until vegetation is well established. Keep mower height high if plastic netting is used to prevent netting from wrapping around mower blades or shaft.

Silt Fence

Description

A temporary measure for sedimentation control. It usually consists of posts with filter fabric stretched across the posts and sometimes with a wire support fence. The lower edge of the fence is vertically trenched and covered by backfill.

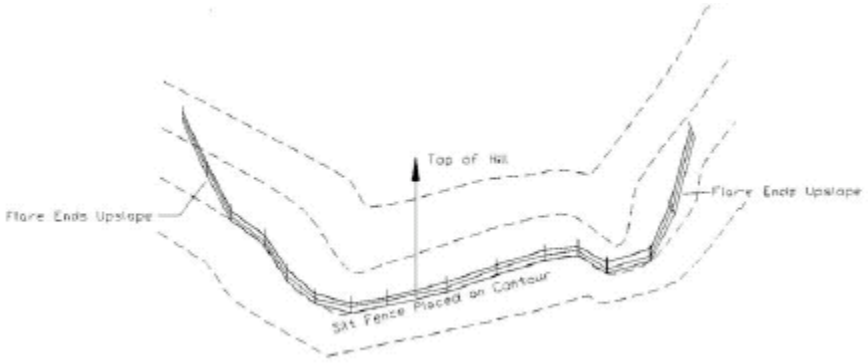
Installation

When - Should be installed prior to major soil disturbance in the drainage area. The drainage area should be limited to 1/4 acre per 100 feet of fence. Area is further restricted by slope steepness as shown in the following table.

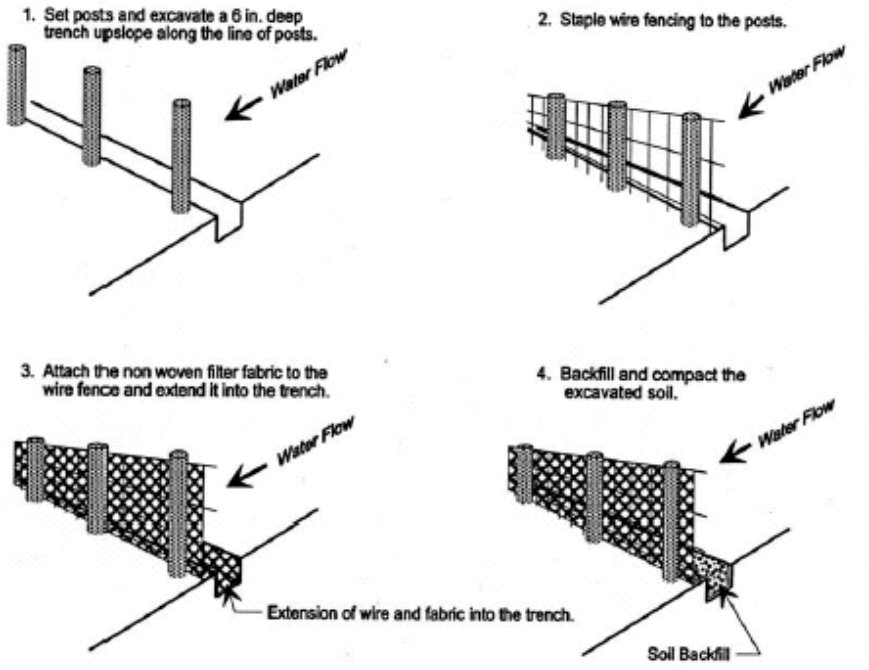
Typical Land Slope and Distance for Sediment Fence

Land Slope (%)	Maximum Slope Distance above Fence (feet)
Less than 2	100
2 to 5	75
5 to 10	50
Greater than 10	*

Where - Should be placed across the bottom of a slope along a line of uniform elevation (perpendicular to the direction of flow). It can be used at the outer boundary of the work area. However, the fence does not have to surround the work area completely. In addition, a silt fence is effective where sheet and rill erosion may be a problem. Silt fences should not be constructed in streams or swales.



Placement of Sediment Fence



Installation of Sediment Fence

How -

1. Dig a trench approximately 8 inches deep and 4 inches wide, or a V-trench along the fence alignment.

2. Drive posts at least 24 inches into the ground on the downslope side of the trench. Space posts a maximum of 8 feet if fence is supported by wire, or 6 feet if high strength fabric and no support fence is used.

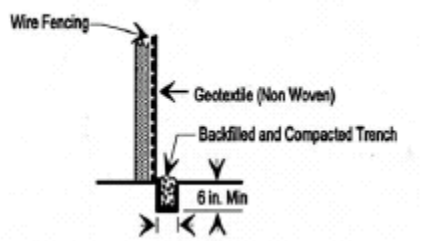
3. Fasten support wire fence to upslope side or posts, extending 6 inches into the trench as shown.

4. Attach continuous length of fabric to upslope side of fence posts. Try to minimize the number of joints. Avoid joints at low points in the fence line. Where joints are necessary, fasten fabric securely to support posts and overlap to the next post.

5. Place the bottom 1 foot of fabric in the 8 inch deep trench, lapping toward the upslope side. Backfill with compacted earth or gravel as shown.

6. To reduce maintenance, excavate a shallow sediment storage area in the upslope side of the fence. Provide good access in areas of heavy sedimentation for clean out and maintenance.

7. Allow for safe bypass of storm flow to prevent overtopping failure of fence.



Detail of Sediment Fence Installation

Operation and Maintenance

- Inspect sediment fences at least once a week and after each rainfall. Make any required repairs immediately.
- Should the fabric of a sediment fence collapse, tear, decompose or become ineffective, replace it promptly.
- Remove sediment deposits as necessary to provide adequate storage volume for the next rain and to reduce pressure on the fence. Take care to avoid damaging or undermining the fence during cleanout.
- Remove all fencing materials and unstable sediment deposits and bring the area to grade and stabilize it after the contributing drainage area has been properly stabilized.

Rock Outlets (Riprap)

Description

A structure constructed to control erosion at the outlet of a channel or conduit. A rock outlet is an apron constructed or rock riprap designed to prevent scour at storm water outlets, and to minimize the potential for downstream erosion by reducing the velocity of concentrated storm water flows.

Installation

When - This practice applies where the discharge velocity of a pipe, box culvert, diversion or other water conveyance structure exceeds the permissible velocity of the receiving area.

Where - Should be installed on steeply sloped swales, or in swales where adequate vegetation cannot be established.

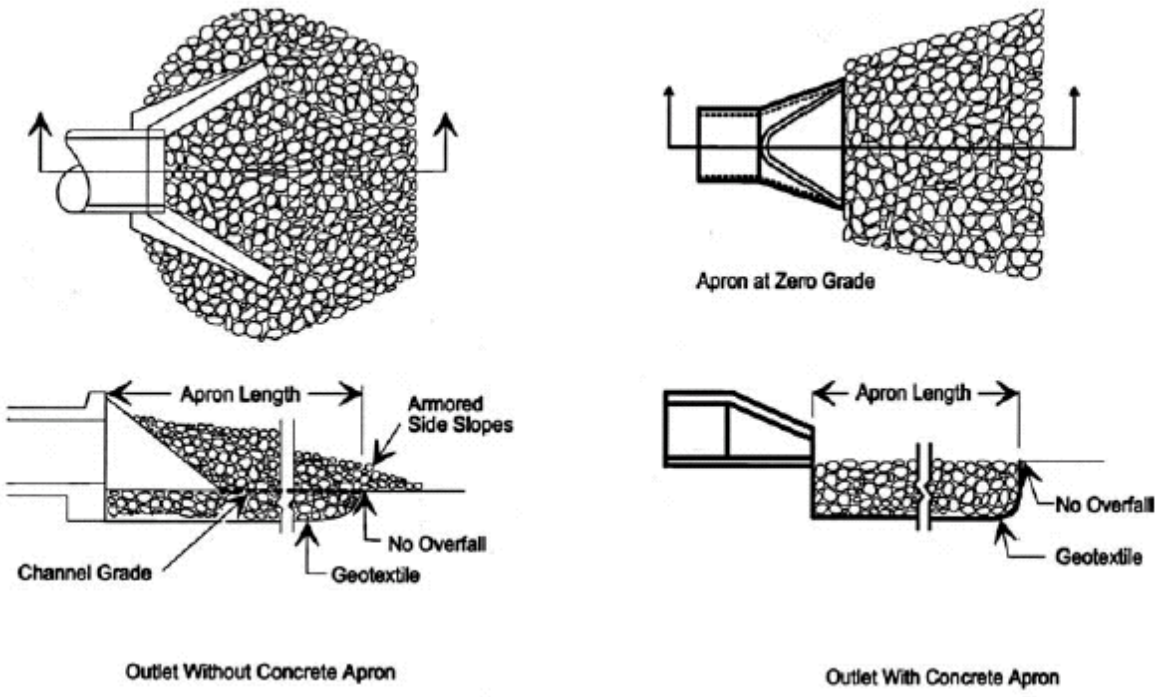
How -

- Clear the foundation area of trees, stumps, brush, sod and all other unsuitable material which would interfere with construction of the rock outlet.
- Excavate the apron area subgrade below design elevation to allow for thickness of the filter layer and the riprap.
- Compact any fill used in the subgrade to the specified maximum density as determined by testing, and smooth enough to protect fabric (if used) from tearing.
- Place the geotextile fabric on the compacted smooth foundation. If more than one fabric piece is needed, the upstream piece should overlap the downstream piece by at least 1.5 feet in all directions.
- If the geotextile fabric tears when placing the riprap, repair immediately by laying and stapling a piece of fabric over the damaged area, overlapping the undamaged areas by at least 1.5 feet in all directions.
- Material used should be a clean, free draining granular material with sufficient fine material to prevent subgrade from passing through the filter layer. Gradation should be specified in the design and verified by testing.
- Place gravel in a layer of uniform thickness and compact as specified in the design. Care should be taken to avoid segregation of particle sizes during placement.

- Install the riprap to the lines and elevations shown in the plans. If there is no defined channel, the final cross-section should be level or slightly depressed in the middle; if well defined, the filter and riprap should extend to the top of the bank.

- Make sure the top of the rock apron is level with or slightly below the receiving stream. (Riprap should not restrict the channel or produce an overfall.)

- Blend the riprap smoothly to the surrounding grade.



Typical Rock Outlet

Operation and Maintenance

- Inspect rock outlets after storm events for stone displacement and for erosion at the sides and ends of the apron.

- Make needed repairs immediately; use appropriate size stone, and do not place them above finished grade.

Erosion Control Blankets

Description

Erosion control blankets are a porous fabric called geotextiles used in the construction industry for a variety of uses including; separators, reinforcement, filtration and drainage, and erosion control.

Erosion control blankets can be made of straw, jute, wood or other plant fibers; plastic, nylon, paper or cotton. Some important factors in the choice of a blanket are: soil conditions, steepness of slope, length of slope, type and duration of protection required to establish desired vegetation, and probable shear stress.

Installation

When

Type of Erosion Control	Main Use	Comments
Netting	Synthetic or natural fiber mesh installed over disturbed area to hold organic mulch and/or seed in place.	Provides minimal structural erosion resistance. Mulch applied using standard procedures.
Biodegradable Erosion Control Blanket	Natural fiber blanket held together by netting to provide temporary erosion protection on slopes up to 1:1; and channels with permissable shear stress up to 4 lbs./ft.	Provides 1- to 5-year protection from erosion. Metal staples used as anchors.
Permanent Erosion Control Blanket	Synthetic blanket material which provides permanent erosion control on slopes up to 1:1; channels with increased water flow velocities and increased shear stress.	Provides minimal protection from wave action around ponds and lakes. Permanent erosion control blankets extend the limits of vegetation. Metal staples used as anchors.
Turf Reinforcement Mat	3-dimensional permanent synthetic mat that provides a matrix to greatly reinforce the root system of the desired vegetation for permanent erosion protection in high flow channels and on critical slopes.	Provides a substantial increase in erosion resistance. May provide erosion protection equivalent to stone or concrete liners.

-

Types of Erosion Control Blankets

Source: Adapted from North Carolina Field Manual, 1991

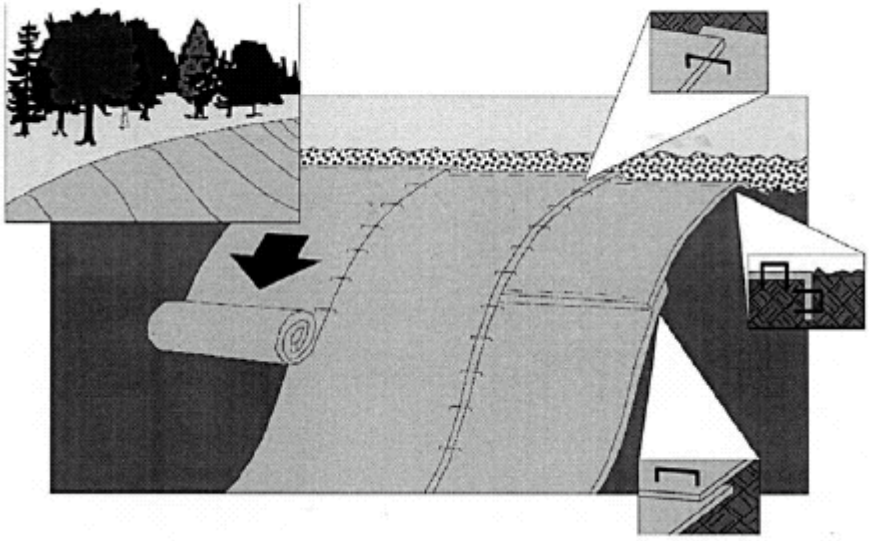
- Two important factors in the choice of a mat are steepness of slope (up to 1:1) and channel velocity (up to 12 fps).

Where - This practice is best utilized on slopes and channels where the erosion hazard is high, and plant growth is likely to be too slow to provide adequate protective cover. Erosion control blankets are typically used as an alternative to mulching but can also be used to provide structural erosion protection.

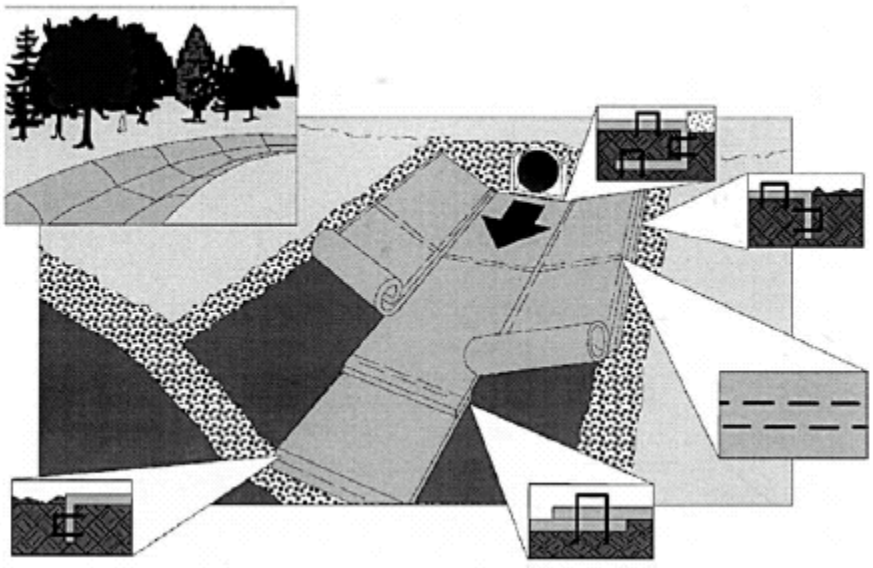
How -

- Erosion control products should be installed in accordance with the manufacturers' recommendations and specifications, including check slots and stapling materials.

- Anchor product so that a continuous, firm contact (no tenting) with the soil surface/seed bed is maintained. Failure to do this could result in soil erosion which would require regrading and reseeding.



Typical Installation of Erosion Control Blankets on a Slope



Typical Installation of Erosion Control Blankets on a Channel

Operation and Maintenance

- Inspect after storm events, until vegetation is established, for erosion or undermining beneath the blankets. If any area shows erosion, pull back that portion of the blanket, add tamped soil and reseed; then resecure the blankets.

- If blankets should become dislocated or damaged, repair or replace and resecure immediately.

Rock Ditch Check

Description

Rock ditch checks operate by intercepting and ponding sediment-laden runoff. Ponding the water dissipates the energy of any incoming flow and allows a large portion of the suspended sediment to settle. Water exits the ditch check by flowing over its crest.

Installation

When – Whenever conditions warrant intercepting runoff.

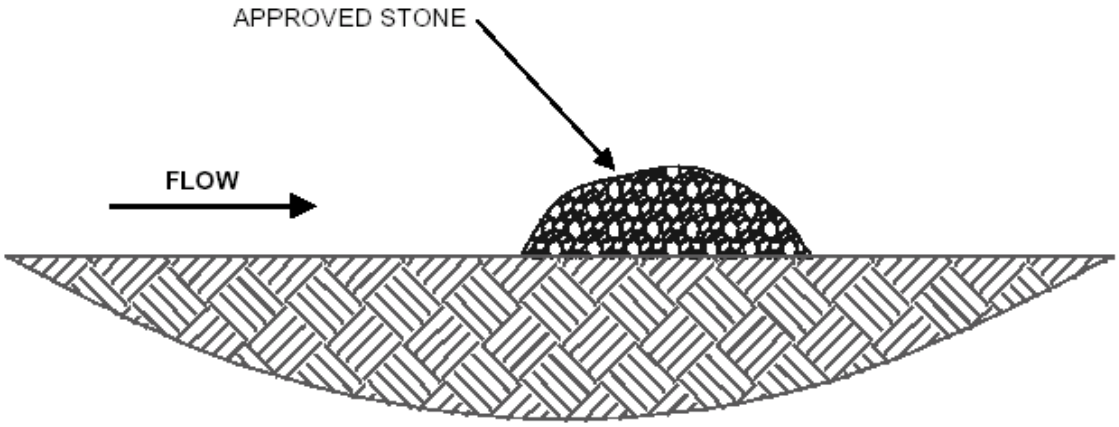
Where – Rock ditch checks are best used for ditches that eventually will have a riprap lining. Upon completion of the project, the rock from the check can be spread out to form a riprap lined channel.

How –

- Rock ditch checks should be perpendicular to the flowline of the ditch.
- Rock ditches must be designed so that water can flow over them, not around the sides.
- The ditch check should extend far enough so that the ground level at the ends of the check is higher than the low point on the crest of the check.
- The ditch check should be 18 to 24 inches high and have side slopes no steeper than 1:1.

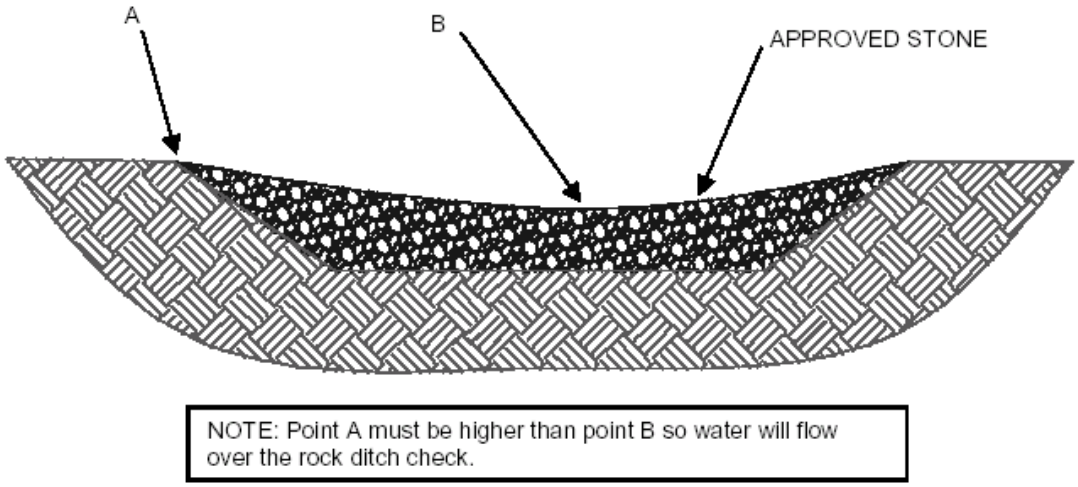
Ditch-Check Spacing	
Ditch Grade (percent)	Check Spacing (feet)
5.0	59
6.0	49
7.0	43
8.0	36
9.0	33
10.0	30

Source: NDDoH BMP Guidance Manual



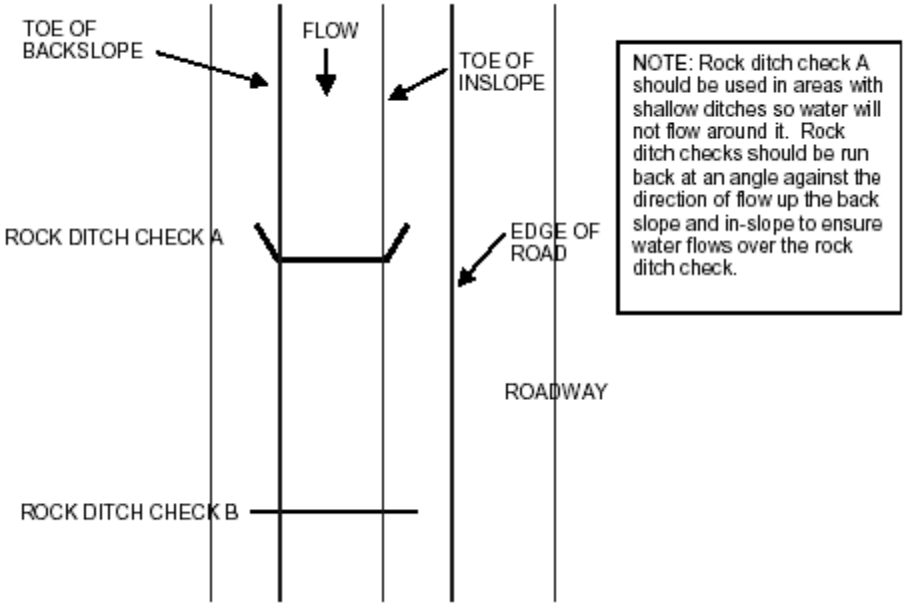
Rock Ditch Installation – Side View

Source: NDDoH BMP Guidance Manual



Rock Ditch Installation – Elevation View

Source: NDDoH BMP Guidance Manual



Placement of Rock Ditch Check

Source: NDDoH BMP Guidance Manual

Operation and Maintenance

- Rock ditch checks should be inspected every seven days and within 24 hours of a rainfall of 0.5 inches or more.
- Water flowing around the ditch check usually is cause by insufficient dike check length. Extend check a sufficient length so that the ground level at the ends are higher than the low point on the crest of the check.
- After a heavy rainstorm, inspect the rock ditch check for any displaced stones. Fill void areas immediately.
- Any accumulated sediment behind the ditch check should be removed when it reaches one-half of the original exposed height of the rock ditch check.

Appendix 3

GEOTECHNICAL - TESTING LAB
1000 W Nifong Boulevard, Building 1
Columbia, Missouri 65203
(573) 447-0292

August 26, 2024

Bartlett & West
601 Monroe St. Ste. 201
Jefferson City, MO 65101

Attn: Austin Johnson, PE

Re: Vehicle Bridge over Spring Branch
Bennett Springs, Missouri
Crockett GTL Project Number: G241066

Dear Mr. Johnson:

Crockett Geotechnical Testing Lab (Crockett GTL) has conducted a geotechnical investigation for a new replacement-bridge planned to be located in Bennett Springs State Park near Lebanon, Missouri.

Site Location:

Item	Description
Location	This project is located immediately upstream from the existing low water crossing across Spring Branch in Bennett Springs State Park near Lebanon, Missouri A Site Location Map showing the approximate location of this project is included with this report
Lat. / Long. Coordinates	37.733401, -92.860282
Existing improvements	Undeveloped in the area of proposed construction
Current ground cover	Park-like lawn areas, shrubs and mature trees

Project Description:

Item	Description
Proposed structure	A new single-span bridge to replace a low water crossing
Bridge Construction	It is anticipated each bent will be supported by drilled piers or by pre-bored H-piles

Item	Description
Grading	Up to 5 feet of new structural fill will be required for the new bridge alignment
Slopes	Slope design is not part of this scope
Below grade areas	Bridge abutments

Scope of Services: Our services included the drilling of three (3) borings at accessible locations near the proposed structures end bents. Boring locations were designated by a CGTL geotechnical engineer and were staked in the field by the drill crew.

Boring elevations were obtained using sheet C-101, Plan Profile prepared by Bartlett & West. Boring elevations were rounded to the nearest foot.

Laboratory tests were also performed and the test results are included on the boring logs. Boring locations are indicated on the boring location plan attached to this letter.

Karst Features: Karst features, including caves and sinkholes, are commonly present in the Gasconade formation which underlies the project area; However, according to the GEOSTRAT web page no sinkholes are known to exist, or are published to exist, within 5 miles of this project site.

Losing and/or gaining streams are another type of karst feature that are present in this general area. According to the GEOSTRAT web page losing and gaining streams are located nearby, within 0.25 miles of this project site

Springs, another karst feature, typically associated with caves, sinkholes and losing/gaining streams are also present in this general area. Several springs are located within 1,000 feet of the project site.

Although no evidence of karst features or activity was identified in the borings, it is difficult to predict future karst activity. Sinkholes, springs and caves in this area are in various stages of development and can appear at any time. Site grading and drainage may alter site conditions and could possibly cause sinkholes in areas that have no history of this activity.

Encountered Subsurface Conditions: Detailed descriptions of the encountered materials are listed on the individual boring logs attached to this letter. Strata lines indicate the approximate location of changes in material types. The transition between material types may be gradual.

All borings encountered about 2 to 4-inches of topsoil at the ground surface. The thickness of the topsoil is expected to vary elsewhere on the site.

Underlying the topsoil in all borings was lean clay. The lean clay extended to a depth of about 3.5 to 13 feet in these borings.

Underlying the lean clay in borings B-1 and B-2 was gravelly lean clay. The gravelly lean clay extended to a depth of about 8 to 13 feet in these borings.

Underlying the lean clay in boring B-3 and gravelly lean clay in borings B-1 and B-2 was gravel with occasional cobbles and boulders. The gravel with occasional cobbles and boulders extended to a depth of about 9.0 to 16.0 feet in these borings.

Underlying the gravel with occasional cobbles and boulders, in all borings, was dolomite. The upper surface of the dolomite was weathered. Split-spoon sampler and auger refusal were achieved in the dolomite at depths ranging from about 9.0 to 17.0 feet. Borings B-1 and B-3 were advanced past auger refusal depths using NQ2 diamond-bit rock coring techniques. Coring was terminated in boring B-1 at about 19.3 feet in depth and in boring B-3 at about 27.0 feet in depth.

Groundwater was encountered in all borings at depths ranging from 8.0 to 13.0 feet while drilling, at the completion of drilling and for the short duration the borings were allowed to remain open. The boreholes were backfilled, for safety reasons, and no significantly delayed groundwater readings were obtained. Groundwater records are indicated on the boring logs included in the Appendix of this report.

Groundwater levels depend on seasonal and climatic variations and the water levels in Spring Branch. Groundwater may be present at different levels in the future.

Foundation Recommendations: Based on subsurface conditions encountered at the boring locations, we recommend the bridge abutments be supported by drilled piers or H-piles. Pre-boring may be required for the H-piles.

Drilled Piers: The design parameters provided in the following table are based on the results of field and laboratory testing, published values, and our past experience with similar conditions.

Drilled Pier Design Parameters	
Allowable End Bearing Pressure • Assumes pier will be inspected during installation	50,000 psf
Minimum Socket Length in Sound Rock • Weathered rock shall not be counted as part of the rock socket	One shaft diameter or 3.0 feet, whichever is greater
Minimum Shaft Diameter	2.5 feet
Approximate Settlement • Total • Differential	 ‹ 1 inch ‹ ¾ inch

Special drilling techniques may be required on this site and the contractor should be prepared for difficult drilling conditions. Temporary casing may be needed to advance drilled pier excavations.

Groundwater should be expected to be encountered during pier installation and the contractor should be prepared to handle wet drilling conditions. Groundwater levels depend on seasonal and climatic variations and may be present at different levels in the future.

For proper performance of the drilled pier foundation system, it is critical for the bottom of the pier excavation be cleaned of any water and loose material prior to placing reinforcing steel and concrete. Concrete should be placed soon after excavating to minimize bearing surface disturbance. Any water accumulating in the pier excavation should be pumped from the excavation or the water level should be allowed to stabilize and then concrete should be placed using the tremie method.

If concrete will be placed as the temporary casing is being removed, we recommend the concrete mixture be designed with a slump of about 5 to 7 inches to reduce the potential for arching when removing the casing. While removing the casing from a pier excavation during concrete placement, the concrete inside the casing should be maintained at a sufficient level to resist any earth and hydrostatic pressures outside the casing during the entire casing removal procedure.

Because rock excavation will be required if drilled piers are used to support the proposed bridge, we recommend unit rates for rock excavation be established as part of the bidding process.

Steel Piles: The bridge can also be supported by HP section piles bearing on dolomite. HP section piles driven to practical refusal, using an appropriately sized hammer, could be designed using a maximum allowable working stress in the pile steel of 25% of the pile steel's yield strength or 9 ksi for typical 36 ksi steel.

The quality and depth of the dolomite may vary and several feet of pile penetration may be required to achieve practical refusal. Actual pile lengths are expected to vary. The contractor should be prepared to pre-bore in order to install sufficient pile length to meet minimum MoDOT embedment requirements.

Driven piles should be installed in accordance with Section 702 of MoDOT's Standard Specifications for Highway Construction (most recent version). Further, we recommend the design load bearing capacity of the piles be verified by an appropriate dynamic pile driving formula such as that used by MoDOT. Pile foundations designed and constructed as recommended in this report would be expected to experience total settlement of less than 1 inch and differential settlement of less than ½ inch, in addition to elastic shortening of the pile materials.

Care should be taken not to overdrive and damage the piles during installation. The contractor should be prepared to cut or splice piles, as necessary.

Group Effect – Axially Loaded: Piles and piers should be spaced a minimum of 3 diameters center-to-center. Closer spacing may require a reduction in axial load capacity. Axial capacity reduction can be determined by comparing the allowable axial capacity determined from the sum of individual piles in a group versus the capacity calculated using the perimeter and base of the group acting as a unit. The lesser of the two capacities should be used in design.

Group Effect – Laterally Loaded: Laterally loaded piles/piers behave as a group when center to center spacing is less than 8 diameters in the direction of loading. Allowable passive resistance provided by a row of piles/piers in line with the direction of the load should be reduced as determined by multiplying the individual lateral resistances of the piles/piers by the number of piles/piers in line and the appropriate reduction factor provided in the following table:

Pile/Pier Group Effect	
Centerline to Centerline Pile/Pier Spacing in Direction of Loading (B = Pile/Pier Width)	Lateral Resistance Reduction Factor
8B	1.00
6B	0.70
4B	0.40
3B	0.25

Lateral loads acting perpendicular to a row of piles/piers with center-to-center spacing of 3 diameters or less will cause the foundations to react essentially as a vertical wall. With spacing of greater than 3 diameters, the values provided in the previous table for individual piles may be used.

General Comments: The recommendations provided herein are for the exclusive use of our client. Our recommendations are specific only to the project described herein and are not meant to supersede more stringent requirements of local ordinances or codes. The recommendations are based on subsurface information obtained at our boring locations, sample locations, our understanding of the project as described in this report, and geotechnical engineering practice consistent with the current standard of care. No warranty is expressed or implied. CGTL should be contacted if conditions encountered are not consistent with those described.

CGTL should be provided with a set of final plans and specifications, once they are available, to review whether our recommendations have been understood and applied correctly and to assess the need for additional exploration or analysis. Failure to provide these documents to CGTL may nullify some or all of the recommendations provide herein. In addition, any changes in the planned project or changes in site conditions may require revised or additional recommendations on our part.

The scope of our services does not include slope stability or any environmental assessment or investigation for the presence, or absence, of toxic materials in, on, or near the project site. Any statements in this report regarding odors, staining, or other unusual conditions are strictly for the information of our clients.

If you have any questions concerning this report, or if we may be of further service, please contact us.

Sincerely,

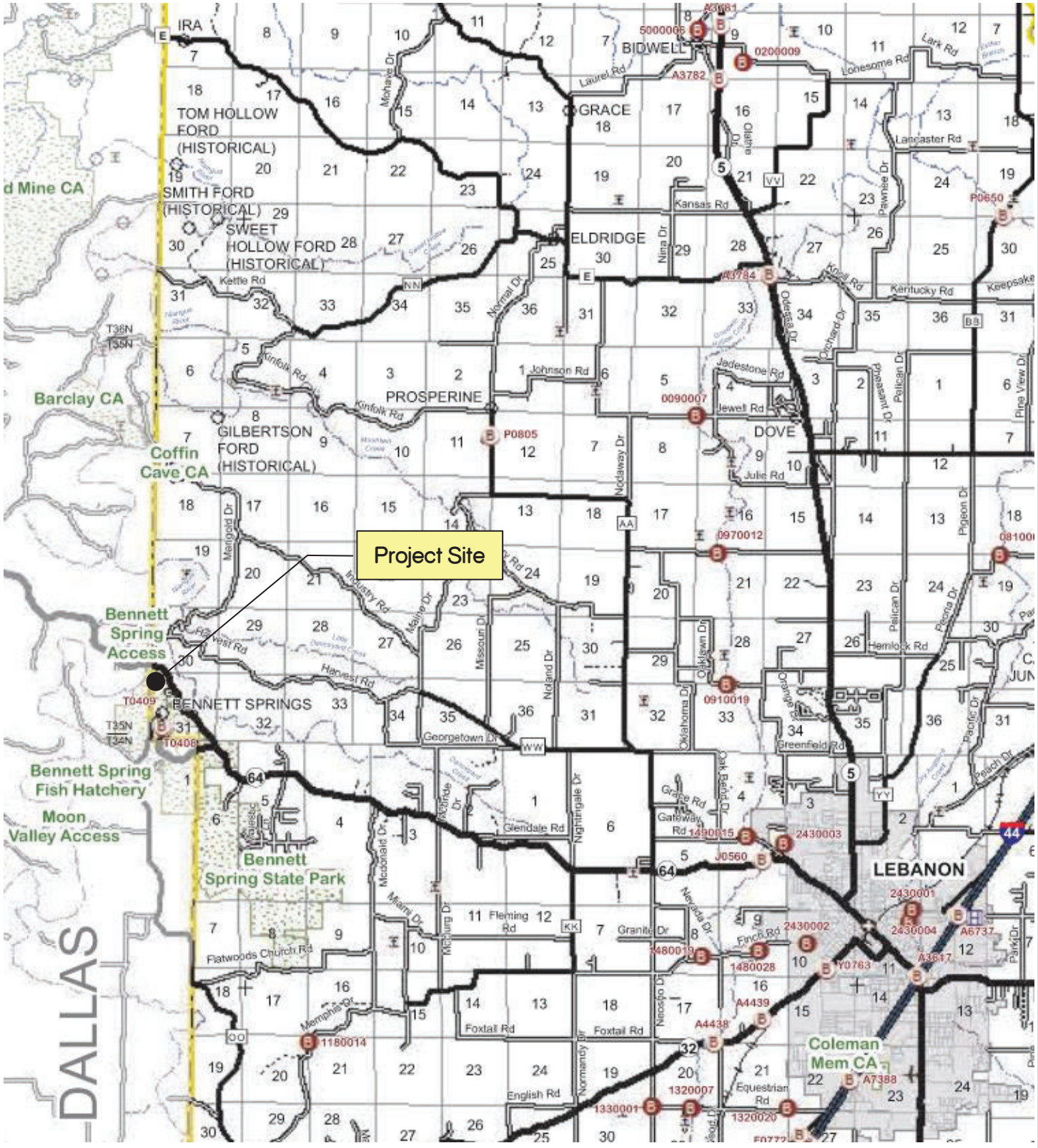
Collin Walsh, E.I.
Project Manager

Eric H. Lidholm, P.E.
Principal
Missouri: E-23265

Attachments

- Site Location Plan
- Boring Location Map
- Boring Logs
- Boring Log Legend and Nomenclature
- Core Photo Log

ATTACHMENTS



SITE LOCATION MAP

BENNETT SPRINGS BRIDGE
BENNETT SPRINGS, MISSOURI

PROJECT NO.: G241066

Prepared By:
CROCKETT
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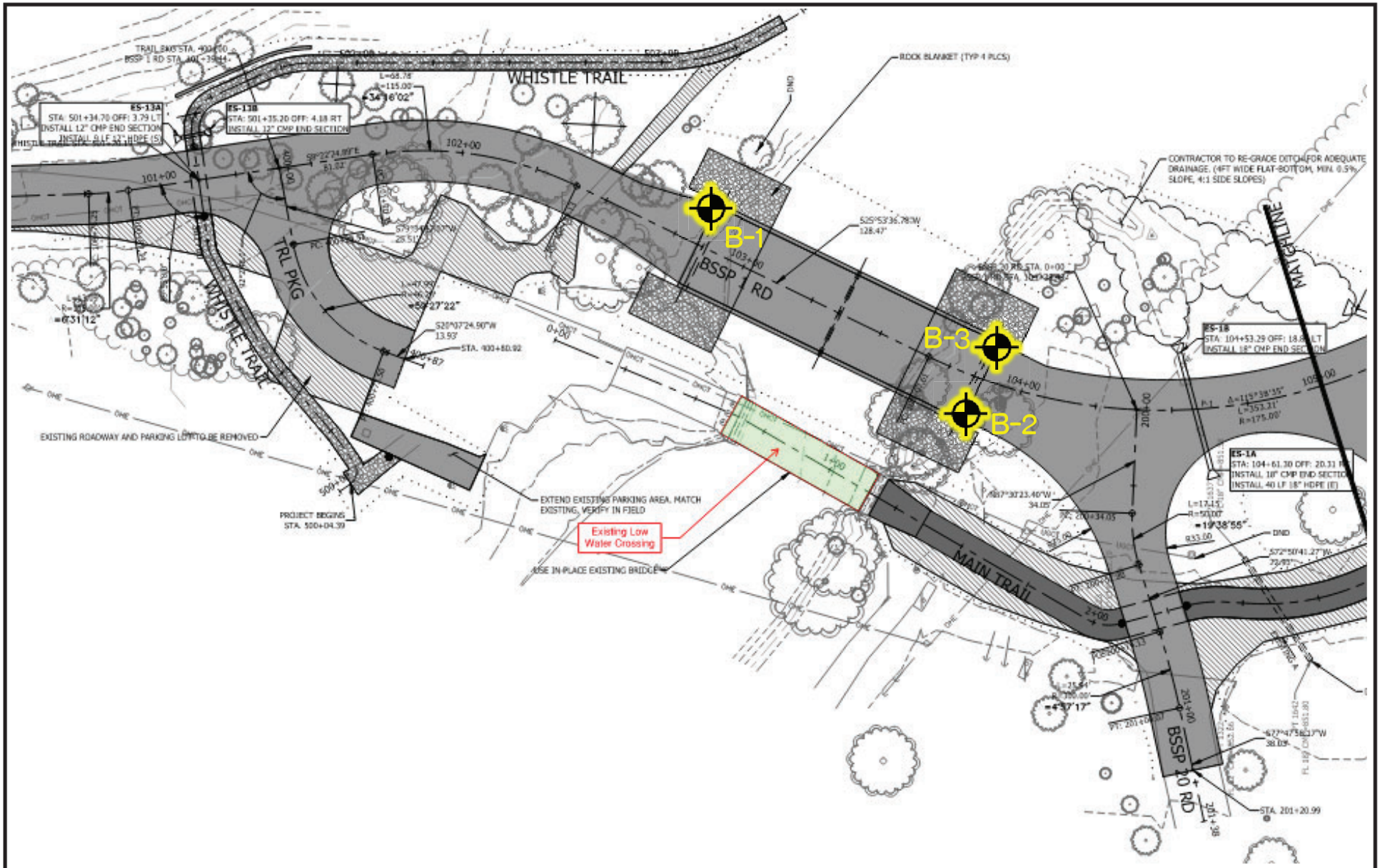

BORING LOCATION PLAN

BENNETT SPRINGS BRIDGE
BENNETT SPRINGS, MISSOURI

PROJECT NO: G241066

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CROCKETT
GEOTECHNICAL - TESTING LAB

BORING NUMBER B-1

CLIENT Bartlett & West
PROJECT NAME Vehicle Bridge over Spring Branch
PROJECT NUMBER G241066
PROJECT LOCATION Bennett Springs State Park near Lebanon, Missouri
DATE STARTED 8/6/24 **COMPLETED** 8/6/24
GROUND ELEVATION 848 ft MSL **HOLE SIZE** 6"
DRILLING CONTRACTOR IPES
GROUND WATER LEVELS:
DRILLING METHOD 3.25" HSA & NQ2 Diamond Bit
AT TIME OF DRILLING 8.00 ft / Elev 840.00 ft
LOGGED BY Werner **CHECKED BY** Lidholm
AT END OF DRILLING 8.00 ft / Elev 840.00 ft
NOTES Borehole backfilled upon completion
0.25hrs AFTER DRILLING 8.00 ft / Elev 840.00 ft

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY LENGTH	BLOW COUNTS (N VALUE)	PENETROMTER (psf)	UNC. COMP. (psf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX
0		0.2 TOPSOIL (2-inches) 847.8 LEAN CLAY: Brown, trace sand and gravel	SPT 1	2	3-5-8 (13)	6400			15			
		3.5 844.5 GRAVELY LEAN CLAY: Brown, with sand Borehole caved at 4' while drilling	SPT 2	2	4-5-4 (9)	gravel			22			
5		8.0 ▼ 840.0 9.0 GRAVEL: Brown, trace clay, trace sand, possible cobbles and boulders 839.0 WEATHERED DOLOMITE: Gray	SPT 3	8	20-50/3"	gravel			14			
10		10.8 837.2 DOLOMITE: Gray, hard, occasional cherty zones RQD = 50%	RC 4	54								
15		RQD = 63%	RC 5	54								
		19.3 828.8										

Split-spoon sampler refusal at 9.25 feet
Bottom of borehole at 19.3 feet.

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CROCKETT
GEOTECHNICAL - TESTING LAB

BORING NUMBER B-2

CLIENT Bartlett & West
PROJECT NAME Vehicle Bridge over Spring Branch
PROJECT NUMBER G241066
PROJECT LOCATION Bennett Springs State Park near Lebanon, Missouri
DATE STARTED 8/6/24 **COMPLETED** 8/6/24
GROUND ELEVATION 853 ft MSL **HOLE SIZE** 4"
DRILLING CONTRACTOR IPES
GROUND WATER LEVELS:
DRILLING METHOD 4" SSA
AT TIME OF DRILLING 13.00 ft / Elev 840.00 ft
LOGGED BY Werner **CHECKED BY** Lidholm
AT END OF DRILLING 13.00 ft / Elev 840.00 ft
NOTES Borehole backfilled upon completion
0.25hrs AFTER DRILLING 13.00 ft / Elev 840.00 ft

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY LENGTH	BLOW COUNTS (N VALUE)	PENETROMTER (psf)	UNC. COMP. (psf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0		0.3 TOPSOIL (3-inches) 852.8										
		LEAN CLAY: Brown, trace sand and gravel	SPT 1	9	5-5-5 (10)	4800			14			
			SPT 2	11	5-4-3 (7)	12000			19			
5		7.5 845.5										
		GRAVELY LEAN CLAY: Brown, with sand	SPT 3	5	6-8-6 (14)	gravel			8			
10		13.0 840.0										
		GRAVEL: Brown, with clay, trace sand, possible cobbles	SPT 4	6	5-4-3 (7)	gravel			22			
		Borehole caved at 13 feet while drilling										
15		17.0 836.0										
		17.3 WEATHERED DOLOMITE: Gray, hard 835.7										
		17.5 DOLOMITE: Gray, hard 835.5										
		Auger refusal at 17.5 feet										
		Bottom of borehole at 17.5 feet.										

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CROCKETT GEOTECHNICAL - TESTING LAB

BORING NUMBER B-3

CLIENT Bartlett & West
PROJECT NAME Vehicle Bridge over Spring Branch
PROJECT NUMBER G241066
PROJECT LOCATION Bennett Springs State Park near Lebanon, Missouri
DATE STARTED 8/6/24 **COMPLETED** 8/6/24
GROUND ELEVATION 853 ft MSL **HOLE SIZE** 4"
DRILLING CONTRACTOR IPES
GROUND WATER LEVELS:
DRILLING METHOD 4" SSA & NQ2 Diamond Bit
AT TIME OF DRILLING 13.00 ft / Elev 840.00 ft
LOGGED BY Werner **CHECKED BY** Lidholm
AT END OF DRILLING 13.00 ft / Elev 840.00 ft
NOTES Borehole backfilled upon completion
0.25hrs AFTER DRILLING 13.00 ft / Elev 840.00 ft

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY LENGTH	BLOW COUNTS (N VALUE)	PENETROMTER (psf)	UNC. COMP. (psf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0		0.3 TOPSOIL (4-inches) 852.7 LEAN CLAY: Brown, trace sand and gravel	SPT 1	7	5-4-4 (8)	8400			11			
			SPT 2	8	6-5-7 (12)	12000			15			
5												
		--: with gravel	SPT 3	10	5-5-5 (10)	gravel			9			
10		Borehole caved at 11 feet										
		13.0 ▼ 840.0 GRAVEL: Brown, with clay, trace sand, possible cobbles	SPT 4	7	3-3-8 (11)	gravel			17			
15		Borehole caved at 13 feet while drilling										
		16.0 837.0 WEATHERED DOLOMITE: Gray										
		17.0 836.0 DOLOMITE: Gray, hard, occasional cherty zones, occassional weathered zones	SPT 5	0	50/0"							
20		RQD = 32%	RC 6	45								
25		RQD = 25%	RC 7	43								
		27.0 826.0										

Split-spoon sampler refusal at 17 feet
Auger refusal at 17 feet
Bottom of borehole at 27.0 feet.

BORING LOG LEGEND AND NOMENCLATURE

Sample Type	Description
AU	Auger sample, disturbed, obtained from auger cuttings
NR	No recovery or lost sample
RC	Rock core, diamond core bit, nominal 2-inch diameter rock sample (ASTM D 2113)
ST	Thin walled (Shelby) tube sample, relatively undisturbed (ASTM D 1587)
SPT	Split spoon sample, disturbed (ASTM D 1586)
VA	Shear vane (ASTM D 2753)

Grain Size Terminology	
Boulders	Larger than 12-inches
Cobbles	3-inches to 12-inches
Gravel	Retained on #4 sieve to 3-inches
Sand	Retained on #200 sieve but passes #4 sieve
Silt or Clay	Passes #200 sieve

Descriptor	Relative Proportion of Sand and Gravel	Relative Proportion of Fines
Trace	Less than 15% by dry weight	Less than 5% by dry weight
With	15% to 30% by dry weight	5% to 12% by dry weight
Modifier	More than 30% by dry weight	More than 12% by dry weight

Relative Density of Coarse grained Soils	
Descriptive Term	SPT N-Value, Blows/Foot
Very Loose	0 – 3
Loose	4 – 9
Medium Dense	10 – 29
Dense	30 – 49
Very Dense	50+

Consistency of Fine Grained Soils		
Descriptive Term	SPT N-Value, Blows/Foot	Unconfined Compressive Strength, psf
Very Soft	0 – 1	0 – 500
Soft	2 – 3	501 – 1,000
Medium	4 – 9	1,001 – 2,000
Stiff	10 – 29	2,001 – 4,000
Very Stiff	30 – 49	4,001 – 8,000
Hard	50+	› 8,000

USCS Soil Classification System				
Major Divisions			Group Symbol	Group Name
coarse grained soils more than 50% retained on #200 sieve	gravel ›50% of coarse fraction retained on #4 (4.75 mm) sieve	clean gravel ‹5% small than #200 sieve	GW	well-graded gravel, fine to coarse gravel
			GP	poorly graded gravel
		gravel with ›12% fines	GM	silty gravel
			GC	clayey gravel
	sand ›50% of coarse fraction passes #4 (4.75 mm) sieve	clean sand	SW	well-graded sand, fine to coarse sand
			SP	poorly graded sand
		sand with ›12% fines	SM	silty sand
			SC	clayey sand
fine grained soils more than 50% passes #200 sieve	silt and clay liquid limit ‹ 50	inorganic	ML	silt
			CL	clay
		organic	OL	organic silt, organic clay
	silt and clay liquid limit ≥ 50	inorganic	MH	silt of high plasticity, elastic silt
			CH	clay of high plasticity, fat clay
		organic	OH	organic clay, organic silt
highly organic soils			PT	peat

Weathering	Description of Rock Properties
Fresh	No discoloration. Not oxidized.
Slightly weathered	Discoloration or oxidation of most surfaces but or short distance from fractures
Moderately weathered	Discoloration or oxidation extends from fractures, usually throughout. All fractured surfaces are oxidized or discolored.
Severely weathered	Discoloration or oxidation throughout. All fractured surfaces are oxidized or discolored. Surfaces are friable.
Decomposed	Resembles a soil. Partial or complete remnant rock structure may be present.

Rock Quality Designator (RQD)	
RQD, %	Rock Quality
90 – 100	Excellent
75 – 90	Good
50 – 75	Fair
25 – 50	Poor
0 – 25	Very poor

Joint, Bedding, and Foliation Spacing in Rock		
Spacing	Joints	Bedding/Foliation
‹ 2-inches	Very close	Very thin
2-inches – 1-foot	Close	Thin
1-foot – 3-feet	Moderately Close	Medium
3-feet – 10-feet	Wide	Thick
›10-feet	Very Wide	Very thick

ROCK CORE PHOTO LOG

Vehicle Bridge over Spring Branch
Bennett Springs, Missouri
Crockett GTL Project Number: G241066

Boring B-1
RC-4 and RC-5
9.3´ - 19.3´

Boring B-3
RC-6 and RC-7
17.0´ - 27.0´