# PROJECT MANUAL

Water System Improvements Bennett Spring State Park Lebanon, Missouri

> Designed By: Darren Krehbiel Consultants, LLC PO Box 587 Camdenton, MO 65020

Date Issued: April 20, 2022

Project No.: X1807-01

# STATE of MISSOURI

OFFICE of ADMINISTRATION Facilities Management, Design & Construction

# SECTION 000107 - PROFESSIONAL SEALS AND CERTIFICATIONS

# PROJECT NUMBER: X1807-01

# 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:



**ENGINEER** – Civil Division: 01, 02, 03, 22, 26, 31, 32, 33.

# END OF SECTION 000107

# DIVISION 00 – PROCUREMENT AND CONTRACTING INFORMATION

TITLE

SECTION

000000	INTRODUCTORY INFORMATION	
000101	Project Manual Cover	1
000107	Professional Seals and Certifications	1
000110	Table of Contents	2
000115	List of Drawings	1
001116	INVITATION FOR BID (IFB) plus Missouri Buys instructions and special notice	3
002113	INSTRUCTIONS TO BIDDERS (Includes MBE/WBE/SDVE Information)	8
003144	MBE/WBE/SDVE Directory	1
**The fo	ollowing documents may be found on MissouriBUYS at https://missouribuys.mo.gov/**	
004000	PROCUREMENT FORMS & SUPPLEMENTS	
004113	Bid Form	*
004336	Proposed Subcontractors Form	*
004337	MBE/WBE/SDVE Compliance Evaluation Form	*
004338	MBE/WBE/SDVE Eligibility Determination	*
004220	Form for Joint Ventures	*
004559	MDE/ W DE/SD V E GOOD Faill Elloit (GFE)	
00/3/0	SDVE Business Form	*
004540	Affidavit of Work Authorization	*
004545	Anti-Discrimination Against Israel Act Certification form	*
005000	CONTRACTING FORMS AND SUPPLEMENTS	
005213	Construction Contract	3
005414	Affidavit for Affirmative Action	1
006113	Performance and Payment Bond	2
006325	Product Substitution Request	2
006519.	16 Final Receipt of Payment and Release Form	1
006519.	18 MBE/WBE/SDVE Progress Report	2
006519.2	21 Affidavit of Compliance with Prevailing Wage Law	1
007000	CONDITIONS OF THE CONTRACT	
007213	General Conditions	20
007300	Supplementary Conditions	1
007346	Wage Rate	4
DIVISIO	DN 01 – GENERAL REQUIREMENTS	
011000	Summary of Work	4
012100	Allowances	2
012300	Alternates	1
012600	Contract Modification Procedures	2
013100	Coordination	4
013115	Project Management Communications	4
013200	Schedule – Dar Chart	4
013500	Submittais Site Security and Health Requirements (DNR)	2
015000	Construction Facilities and Temporary Controls	8
015526	Construction Area Traffic Control	3
015723	Temporary Erosion, Siltation, and Storm Water Pollution Control	8
017113	Overall Site Preparation	1
017400	Cleaning	3
DIVISIO	DN 02 – EXISTING CONDITIONS	
020000	Abbreviations for Codes and Standards Organizations	1
022300	Site Clearing	3
023100	Excavating & Backfilling Trenches	16
024113	Removal of Improvements	1

025100	Water Distribution Piping	17
029250	Permanent Erosion Control and Landscaping	7
<b>DIVISION 03</b>	3 – CONCRETE	
032111	Steel Reinforcing Bars	2
033053	Miscellaneous Cast-In-Place Concrete	7
<b>DIVISION 22</b>	2 – PLUMBING	
221123.13	Booster Pump	2
<b>DIVISION 26</b>	6 – ELECTRICAL	
260500	Electrical	2
<b>DIVISION 31</b>	l – EARTHWORK	
317119	Bore for Pressure Water Line	3
<b>DIVISION 32</b>	2 – EXTERIOR IMPROVEMENTS	
321123	Base-Crushed Aggregate	2
321200	Asphalt Surface Restoration	8
<b>DIVISION 33</b>	3 – UTILITIES	
331116.11	Tracer Wire	4
Appendix A	Land Disturbance Permit	24

### **SECTION 000115 – 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:

	TITLE	<u>SHEET #</u>	DATE	CADD #
1.	Cover Sheet	G-001	4/20/22	X1807-01_4301_53026.DWG
2.	Location Map and General Notes	G-002	4/20/22	X1807-01_4301_53026.DWG
3.	Overall View and Sheet Index	G-003	4/20/22	X1807-01_4301_53026.DWG
4.	Proposed Waterline Plan/Profile	C-100 thru	4/20/22	X1807-01_4301_53026.DWG
		C-110		
5.	Connection to District at Hwy. 64	C-300	4/20/22	X1807-01_4301_53026.DWG
7.	Pressure Reducing Valve	C-301	4/20/22	X1807-01_4301_53026.DWG
8.	Connection to Existing at Park	C-302	4/20/22	X1807-01_4301_53026.DWG
9.	Booster Pump Station	C-303	4/20/22	X1807-01_4301_53026.DWG
10.	Existing Tank / Yard Piping Details	C-304	4/20/22	X1807-01_4301_53026.DWG
11.	Road Bore Crossings	C-305	4/20/22	X1807-01_4301_53026.DWG
12.	Bore Details	C-306	4/20/22	X1807-01_4301_53026.DWG
13.	Connection to Campground 4 and 5	C-307	4/20/22	X1807-01_4301_53026.DWG
14.	Details	C-500 thru	4/20/22	X1807-01_4301_53026.DWG
		C-501		

### **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. Water System Improvements Bennett Spring State Park Lebanon, Missouri **Project No.: X1807-01** 

### 3.0 BIDS WILL BE RECEIVED:

A. Until: 1:30 PM, Thursday, July 14, 2022

### B. Only electronic bids on MissouriBUYS shall be accepted: https://missouribuys.mo.gov. Bidder must be registered to bid.

### 4.0 **DESCRIPTION:**

- A. Scope: The Project consists of highway road bores, wet taps, waterline connection to Laclede PWSD #1 along with new meter, pressure reducing valves, backflow prevention, main valve arrangement with pressure sustaining valve, a booster station, and the construction of water lines; complete with appurtenances, disinfection, a tracer wire system, plus pressure and leakage tests.
- B. MBE/WBE/SDVE Goals: MBE 0%, WBE 0%, and SDVE 3%. NOTE: Only MBE/WBE firms certified by the State of Missouri Office of Equal Opportunity as of the date of bid opening, or SDVE(s) meeting the requirements of Section 34.074, RSMo and 1 CSR 30-5.010, can be used to satisfy the MBE/WBE/SDVE participation goals for this project.
- C. \*\*NOTE: Bidders are provided new Good Faith Effort (GFE) forms on MissouriBUYS.

### 5.0 PRE-BID MEETING:

- A. Place/Time: 10 AM, Tuesday, June, 28, 2022, at the Bennett Spring State Park Visitor Center located at 26250 HWY 64 A, Lebanon, MO 65536.
- 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 \$30 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, <u>https://www.adsplanroom.net</u>. 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: DARREN KREHBIEL CONSULTANTS, LLC, Darren Krehbiel, phone # (573) 346-5316
- B. Project Manager: Eric Hibdon, phone # (573) 522-0322

### 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 <a href="https://oa.mo.gov/facilities/bid-opportunities/bid-listing-electronic-plans">https://oa.mo.gov/facilities/bid-opportunities/bid-listing-electronic-plans</a> after it is verified that at least one bid is awardable and affordable.

# Very Important MissouriBUYS Instructions to Help Submit a Bid Correctly

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

# IMPORTANT REMINDER REGARDING REQUIREMENT FOR OEO CERTIFICATION

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

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

### SECTION 002113 – INSTRUCTIONS TO BIDDERS

### **1.0 - SPECIAL NOTICE TO BIDDERS**

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

### 2.0 - BID DOCUMENTS

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

### 3.0 - BIDDERS' OBLIGATIONS

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

# 4.0 - INTERPRETATIONS

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

### 5.0 - BIDS AND BIDDING PROCEDURE

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

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

<u>Bid Submittal –</u>	<u>- due before stated date and time of bid opening (see IFB):</u>
004113	Bid Form (all pages are always required)
004322	Unit Prices Form
004336	Proposed Subcontractors Form
004337	MBE/WBE/SDVE Compliance Evaluation Form
004338	MBE/WBE/SDVE Eligibility Determination for Joint Ventures
004339	MBE/WBE/SDVE GFE Determination
004340	SDVE Business Form
004541	Affidavit of Work Authorization
004545	Anti-Discrimination Against Israel Act Certification form

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

### 6.0 - SIGNING OF BIDS

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

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

# 7.0 - RECEIVING BID SUBMITTALS

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

### 8.0 - MODIFICATION AND WITHDRAWAL OF BIDS

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

### 9.0 - AWARD OF CONTRACT

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

- C. In awarding the contract the Owner may take into consideration the bidder's skill, facilities, capacity, experience, responsibility, previous work record, financial standing and the necessity of prompt and efficient completion of work herein described. Inability of any bidder to meet the requirements mentioned above may be cause for rejection of his bid. However, no contract will be awarded to any individual, partnership or corporation, who has had a contract with the State of Missouri declared in default within the preceding twelve months.
- 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 low bidder.
- E. No bid shall be considered binding upon the Owner until the written contract has been properly executed, a satisfactory bond has been furnished, evidence of required insurance coverage, submittal of executed Section 004541, Affidavit of Work Authorization form, documentation evidencing enrollment and participation in a federal work authorization program has been received and an affirmative action plan submitted. Failure to execute and return the contract and associated documents within the prescribed period of time shall be treated, at the option of the Owner, as a breach of bidder's obligation and the Owner shall be under no further obligation to bidder.
- F. If the successful bidder is doing business in the State of Missouri under a fictitious name, he shall furnish to Owner, attached to the Bid Form, a properly certified copy of the certificate of Registration of Fictitious Name from the State of Missouri, and such certificate shall remain on file with the Owner.
- G. Any successful bidder which is a corporation organized in a state other than Missouri shall furnish to the Owner, attached to the Bid Form, a properly certified copy of its current Certificate of Authority to do business in the State of Missouri, such certificate to remain on file with the Owner. No contract will be awarded by the Owner unless such certificate is furnished by the bidder.
- H. Any successful bidder which is a corporation organized in the State of Missouri shall furnish at its own cost to the Owner, if requested, a Certificate of Good Standing issued by the Secretary of State, such certificate to remain on file with the Owner.
- I. Transient employers subject to Sections 285.230 and 285.234, RSMo, (out-of-state employers who temporarily transact any business in the State of Missouri) may be required to file a bond with the Missouri Department of Revenue. No contract will be awarded by the Owner unless the successful bidder certifies that he has complied with all applicable provisions of Section 285.230-234.
- J. Sections 285.525 and 285.530, RSMo, require business entities to enroll and participate in a federal work authorization program in order to be eligible to receive award of any state contract in excess of \$5,000. Bidders should submit with their bid an Affidavit of Work Authorization (Section 004541) along with appropriate documentation evidencing such enrollment and participation. Section-004541, Affidavit of Work Authorization is located on the MissouriBUYS solicitation for this project. Bidders must also submit an E-Verify Memorandum before the Owner may award a contract to the Bidder. Information regarding a E-Verify is located at <a href="https://www.uscis.gov/e-verify/">https://www.uscis.gov/e-verify/</a>. The contractor shall be responsible for ensuring that all subcontractors and suppliers associated with this contract enroll in E-Verify.

### **10.0 - CONTRACT SECURITY**

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

### **<u>11.0 - LIST OF SUBCONTRACTORS</u>**

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

clear, by listing his own firm for the subject category. If any category of work is left vacant, the bid shall be rejected.

### 12.0 - WORKING DAYS

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

### 13.0 - AMERICAN AND MISSOURI - MADE PRODUCTS AND FIRMS

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

### 14.0 - ANTI-DISCRIMINATION AGAINST ISRAEL ACT CERTIFICATION:

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

### **15.0 - MBE/WBE/SDVE INSTRUCTIONS**

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

- 8. **"SERVICE-DISABLED VETERAN ENTERPRISE"** has the same meaning as "Service-Disabled Veteran Business" set forth in section 34.074, RSMo.
- B. MBE/WBE/SDVE General Requirements:
  - 1. For all bids greater than \$100,000, the Bidder shall obtain MBE, WBE and SDVE participation in an amount equal to or greater than the percentage goals set forth in the Invitation for Bid and the Bid Form, unless the Bidder is granted a Good Faith Effort waiver by the Director of the Division, as set forth below. If the Bidder does not meet the MBE, WBE and SDVE goals, or make a good faith effort to do so, the Bidder shall be non-responsive, and its bid shall be rejected.
  - 2. The Bidder should submit with its bid all of the information requested in the MBE/WBE/SDVE Compliance Evaluation Form for every MBE, WBE, or SDVE subcontractor or material supplier the Bidder intends to use for the contract work. The Bidder is required to submit all appropriate MBE/WBE/SDVE documentation before the stated time and date set forth in the Invitation for Bid. If the Bidder fails to provide such information by the specified date and time, the Owner shall reject the bid.
  - 3. The Director reserves the right to request additional information from a Bidder to clarify the Bidder's proposed MBE, WBE, and/or SDVE participation. The Bidder shall submit the clarifying information requested by the Owner within two (2) Working Days of receiving the request for clarification.
  - 4. Pursuant to section 34.074, RSMo, a Bidder that is a SDVE doing business as Missouri firm, corporation, or individual, or that maintains a Missouri office or place of business, shall receive a three-point bonus preference in the contract award evaluation process. The bonus preference will be calculated and applied by reducing the bid amount of the eligible SDVE by three percent of the apparent low responsive bidder's bid. Based on this calculation, if the eligible SDVE's evaluation is less than the apparent low responsive bidder's bid, the eligible SDVE's bid becomes the apparent low responsive bidder's bid, the eligible SDVE's bid becomes the apparent low responsive bid or the amount(s) of any contract awarded. In order to be eligible for the SDVE preference, the Bidder must complete and submit with its bid the Missouri Service Disabled Veteran Business Form, and any information required by the form. The form is available on the MissouriBUYS solicitation for this project.
- C. Computation of MBE/WBE/SDVE Goal Participation:
  - 1. A Bidder who is a MBE, WBE, or SDVE may count 100% of the contract towards the MBE, WBE or SDVE goal, less any amounts awarded to another MBE, WBE or SDVE. (NOTE: A MBE firm that bids as general contractor must obtain WBE and SDVE participation; a WBE firm that bids as a general contractor must obtain MBE and SDVE participation; and a SDVE firm that bids as general contractor must obtain MBE and SDVE participation.) In order for the remaining contract amount to be counted towards the MBE, WBE or SDVE goal, the Bidder must complete the MBE/WBE/SDVE Compliance Evaluation Form (Section 004337) identifying itself as an MBE, WBE or SDVE.
  - 2. The total dollar value of the work granted to a certified MBE, WBE or SDVE by the Bidder shall be counted towards the applicable goal.
  - 3. Expenditures for materials and supplies obtained from a certified MBE, WBE, or SDVE supplier or manufacturer may be counted towards the MBE, WBE and SDVE goals, if the MBE, WBE, or SDVE assumes the actual and contractual responsibility for the provision of the materials and supplies.
  - 4. The total dollar value of the work granted to a second or subsequent tier subcontractor or a supplier may be counted towards a Bidder's MBE, WBE and SDVE goals, if the MBE, WBE, or SDVE properly assumes the actual and contractual responsibility for the work.
  - 5. The total dollar value of work granted to a certified joint venture equal to the percentage of the ownership and control of the MBE, WBE, or SDVE partner in the joint venture may be counted towards the MBE/WBE/SDVE goals.
  - 6. Only expenditures to a MBE, WBE, or SDVE that performs a commercially useful function in the work may be counted towards the MBE, WBE and SDVE goals. A MBE, WBE, or SDVE performs a commercially useful function when it is responsible for executing a distinct element of the work

and carrying out its responsibilities by actually performing, managing and supervising the work or providing supplies or manufactured materials.

- D. Certification of MBE/WBE/SDVE Subcontractors:
  - 1. In order to be counted towards the goals, an MBE or WBE must be certified by the State of Missouri Office of Equal Opportunity and an SDVE must be certified by the State of Missouri, Office of Administration, Division of Purchasing and Material Management or by the Department of Veterans Affairs.
  - 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 (<u>https://apps1.mo.gov/MWBCertifiedFirms/</u>). The Bidder may determine the eligibility of a SDVE subcontractor or supplier by referring to the Division of Purchasing and Materials Management's online SDVE directory (<u>https://oa.mo.gov/sites/default/files/sdvelisting.pdf</u>) or the Department of Veterans Affairs' directory (<u>https://vetbiz.va.gov/basic-search/</u>).
  - 3. Additional information, clarifications, etc., regarding the listings in the directories may be obtained by calling the Division at (573)751-3339 and asking to speak to the Contract Specialist of record as shown in the Supplementary Conditions (Section 007300).
- E. Waiver of MBE/WBE/SDVE Participation:
  - 1. If a Bidder has made a good faith effort to secure the required MBE, WBE and/or SDVE participation and has failed, the Bidder shall submit with its bid the information requested in MBE/WBE/SDVE Good Faith Effort (GFE) Determination form. The GFE forms are located on the MissouriBUYS solicitation for this project. The Director will determine if the Bidder made a good faith effort to meet the applicable goals. If the Director determines that the Bidder did not make a good faith effort, the bid shall be rejected as being nonresponsive to the bid requirements. Bidders who demonstrate that they have made a good faith effort to include MBE, WBE, and/or SDVE participation will be determined to be responsive to the applicable participation goals, regardless of the percent of actual participation obtained, if the bid is otherwise acceptable.
  - 2. In determining whether a Bidder has made a good faith effort to obtain MBE, WBE and/or SDVE participation, the Director may evaluate the factors set forth in 1 CSR 30-5.010(6)(C) and the following:
    - a. The amount of actual participation obtained;
    - b. How and when the Bidder contacted potential MBE, WBE, and SDVE subcontractors and suppliers;
    - c. The documentation provided by the Bidder to support its contacts, including whether the Bidder provided the names, addresses, phone numbers, and dates of contact for MBE/WBE/SDVE firms contacted for specific categories of work;
    - If project information, including plans and specifications, were provided to MBE/WBE/SDVE subcontractors;
    - e. Whether the Bidder made any attempts to follow-up with MBE, WBE or SDVE firms prior to bid;
    - f. Amount of bids received from any of the subcontractors and/or suppliers that the Bidder contacted;
    - g. The Bidder's stated reasons for rejecting any bids;
  - 3. If no bidder has obtained any participation in a particular category (MBE/WBE/SDVE) or made a good faith effort to do so, the Director may waive that goal rather than rebid.

### F. Contractor MBE/WBE/SDVE Obligations

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

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

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

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

Please note that you may search by MBE, WBE, or both as well as by region, location of the business by city or state, as well as by commodity or service.

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

https://oa.mo.gov/sites/default/files/sdvelisting.pdf

https://vetbiz.va.gov/basic-search/



# 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, on behalf of the Department of Natural Resources, Division of State Parks.

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:

Water System Improvements Bennett Spring State Park Lebanon, Missouri

### Project Number: X1807-01

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

### **ARTICLE 2. TIME OF COMPLETION**

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

### **ARTICLE 3. LIQUIDATED DAMAGES**

Whenever time is mentioned in this contract, time shall be and is of the essence of this contract. The Owner would suffer a loss should the Contractor fail to have the work embraced in this contract fully completed on or before the time above specified. THEREFORE, the parties hereto realize in order to adjust satisfactorily the damages on account of such failure that it might be impossible to compute accurately or estimate the amount of such loss or damages which the Owner would sustain by reason of failure to complete fully said work within the time required by this contract. The Contractor hereby covenants and agrees to pay the Owner, as and for **liquidated damages, the sum of \$700** 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 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:

TOTAL CONTRACT AMOUNT:	(\$CONTRACT AMOUNT)
Alternate No. 2:	\$
Alternate No. 1:	\$
Base Bid:	\$

### **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.

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

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

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

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

Total \$

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

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

### **ARTICLE 7. CONTRACT DOCUMENTS**

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

- 1. Division 0 Procurement and Contracting Information, including, but not limited to:
  - a. Invitation for Bid (Section 001116)
  - b. Instructions to Bidders (Section 002113)
  - c. Supplementary Instructions to Bidders (if applicable) (Section 002213)
  - d. The following documents as completed and executed by the Contractor and accepted by the Owner, if applicable:
    - i. Bid Form (Section 004113)
    - ii. Unit Prices (Section 004322)
    - iii. Proposed Contractors Form (Section 004336)
    - iv. MBE, WBE, SDVE Compliance Evaluation Form(s) (Section 004337)
    - v. MBE, WBE, SDVE Eligibility Determination Form for Joint Ventures (Section 004338)
    - vi. MBE, WBE, SDVE Good Faith Effort (GFE) Determination Form (Section 004339)

- vii. Missouri Service Disabled Veteran Business Form (Section 004340)
- viii. Affidavit of Work Authorization (Section 004541)
- ix. Affidavit for Affirmative Action (Section 005414)
- e. Performance and Payment Bond, completed and executed by the Contractor and surety (Section 006113)
- f. General Conditions (Section 007213)
- g. Supplementary Conditions (Section 007300)
- h. 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

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

### **APPROVED:**

Mark Hill, P.E., Director Division of Facilities Management, Design and Construction Contractor's Authorized Signature

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

Corporate Secretary

STATE OF MISS OFFICE OF ADI DIVISION OF FA	SOURI MINISTRATION ACILITIES MANAGEMENT, DESIGN DR AFFIRMATIVE ACTION	AND CONSTRUCTION	PROJECT	NUMBER	
NAWE		First being du	y sworn on oath sta	ates: that	
he/she is the $\Box$ sole prop	rietor $\Box$ partner $\Box$ officer or	□ manager or mana	iging member of		
NAME		a 🛛 sole pro	prietorship 🛛 pa	rtnership	
		□ limited l	iability company (L	LC)	
or $\Box$ corporation, and as	such, said proprietor, partner, or o	officer is duly authorize	d to make this		
affidavit on behalf of said so	le proprietorship, partnership, or	corporation; that under	the contract knowr	as	
PROJECT TITLE	PROJECT TITLE				
Less than 50 persons in the aggregate will be employed and therefore, the applicable Affirmative Action					
requirements as set forth in Article 1.4 of the General Conditions of the State of Missouri have been met.					
PRINT NAME & SIGNATURE			DATE		
NOTARY INFORMATION					
NOTARY PUBLIC EMBOSSER SEAL	STATE OF C	COUNTY (OR CITY OF ST. OUIS)	USE RUBBER STAMP IN BELOW	CLEAR AREA	
	SUBSCRIBED AND SWORN BEFORE ME, 1	THIS			
	NOTARY PUBLIC SIGNATURE	Y COMMISSION EXPIRES			
	NOTARY PUBLIC NAME (TYPED OR PRINTED)				

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, t	heir heirs, executors, administrators and su	ccessors, 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	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 WHER	EOF, the above bounden p, 20	parties have executed	d the within instrume	nt this	day of
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					
Su	rety Name:				
Att	corney-in-Fact:				
Ad	dress of Attorney-in-Fact:				
Telephone Nun	nber of Attorney-in-Fact:				
S	Signature Attorney-in-Fact:				
<b>NOTE</b> : Surety shall at	tach Power of Attorney				

Section 006113 - PERFORMANCE AND PAYMENT BOND 07/16

STATE OF MISSOURI OFFICE OF ADMINISTRATIC DIVISION OF FACILITIES M PRODUCT SUBSTITUT	ON ANAGEMENT, DESIGN AND CONSTRUCTI F <b>ION REQUEST</b>	ON <sup>f</sup>	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 N FROM: BIDDER/CONTRACTOR (PRINT COMPANY NAME)	otice to Proceed as per Article 3 – General C	onditions)			
TO: ARCHITECT/ENGINEER (PRINT COMPANY NAME)					
Bidder/Contractor hereby requests accept provisions of Division One of the Bidding	otance of the following product or system Documents:	ns as a substituti	on in accordance with		
SPECIFIED PRODUCT OR SYSTEM					
SPECIFICATION SECTION NO.					
SUPPORTING DATA					
Product data for proposed substitution	is attached (include description of product, s	tandards, performa	ance, and test data)		
	SPECIFIED PRODUCT	SUBSTITU	JTION REQUEST		
NAME, BRAND					
CATALOG NO.					
MANUFACTURER					
VENDOR					
PREVIOUS INSTALLATIONS	ARCHITECT/ENGINEER				
LOCATION			DATE INSTALLED		
SIGNIFICANT VARIATIONS FROM SPECIFIED P	RODUCT				

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 WOF	3K			
BIDDER'S/CONTRACTOR'S STATEMENT OF CONFORMANCE OF PROPOSED REQUIREMENT:	SUBSTITUTION TO CONTRACT			
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 accepted with the following comments:			
Substitution is not accepted.				
ARCHITECT/ENGINEER	DATE			



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:

- 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.
- 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

STATE OFFIC DIVISI DESIG	STATE OF MISSOURI OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION			PAY APP NO.	PROJECT NUMBER		
<b>MBE/V</b> Remit with (Please ch	VBE/SDVE PROG	CHECK IF FINAL	DATE				
PROJECT TITLE							
PROJECT LOCATION							
FIRM							
ORIGINAL CONTRACT SU Payment) \$	M (Same as Line Item 1. on	TOTAL CONTRACT SL Application for Payment \$	SUM TO DATE (Same as Line Item 3. on Form A of ent)				
THE TOTAL MBE/WBE/SDVE PARTICIPATION DOLLAR AMOUNT OF THIS PROJECT AS INDICATED IN THE ORIGINAL CONTRACT: \$							
SELECT MBE, WBE, SDVE	TOTAL AMOUNT OF SUBCONTRACT	\$ AMOUNT PAID-TO-DATE (include approved contract changes)	CONSULTANT/SUBCONSULTANT OR CONTRACTOR/SUBCONTRACTOR/SUPPLIER COMPANY NAME				
	\$	\$					
MBE UBE SDVE MBE UBE SDVE SDVE	\$	\$					
<ul> <li>MBE</li> <li>WBE</li> <li>SDVE</li> <li>MBE</li> <li>WBE</li> <li>SDVE</li> <li>MBE</li> <li>WBE</li> <li>WBE</li> <li>SDVE</li> </ul>	\$ \$ \$	\$ \$ \$					
<ul> <li>MBE</li> <li>WBE</li> <li>SDVE</li> <li>MBE</li> <li>WBE</li> <li>SDVE</li> <li>MBE</li> <li>WBE</li> <li>SDVE</li> <li>MBE</li> <li>SDVE</li> </ul>	\$ \$ \$	\$ \$ \$ \$					
<ul> <li>MBE</li> <li>WBE</li> <li>SDVE</li> <li>MBE</li> <li>WBE</li> <li>SDVE</li> <li>MBE</li> <li>WBE</li> <li>SDVE</li> <li>MBE</li> <li>SDVE</li> <li>MBE</li> <li>SDVE</li> </ul>	\$ \$ \$ \$	\$ \$ \$ \$					

# 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.

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(a corporation)	(a partnership) (a proprietorship) and	d after being duly swor	n did depose and	say that all provisions
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Statutes, perta	ining to the payment of wages to wor	rkmen employed on pu	blic works project	have been fully satisfied
and there has l	been no exception to the full and con	npleted compliance wit	h said provisions :	and requirements
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	FILE:	Closeout Documents		

# **GENERAL CONDITIONS**

# INDEX

### ARTICLE:

- 1. General Provisions
  - 1.1. Definitions
  - 1.2. Drawings and Specifications
  - 1.3. Compliance with Laws, Permits, Regulations and Inspections
  - 1.4. Nondiscrimination in Employment
  - 1.5. Anti-Kickback
  - 1.6. Patents and Royalties
  - 1.7. Preference for American and Missouri Products and Services
  - 1.8. Communications
  - 1.9. Separate Contracts and Cooperation
  - 1.10. Assignment of Contract
  - 1.11. Indemnification
  - 1.12. Disputes and Disagreements
- 2. Owner/Designer Responsibilities
- **3.** Contractor Responsibilities
  - 3.1. Acceptable Substitutions
  - 3.2. Submittals
  - 3.3. As-Built Drawings
  - 3.4. Guaranty and Warranties
  - 3.5. Operation and Maintenance Manuals
  - 3.6. Other Contractor Responsibilities
  - 3.7. Subcontracts
- 4. Changes in the Work
  - 4.1. Changes in the Work
  - 4.2. Changes in Completion Time
- 5. Construction and Completion
  - 5.1. Construction Commencement
  - 5.2. Project Construction
  - 5.3. Project Completion
  - 5.4. Payments
  - 6. Bond and Insurance

- 6.1. Bond
- 6.2. Insurance
- 7. Termination or Suspension of Contract
  - 7.1. For Site Conditions
  - 7.2. For Cause
  - 7.3. For Convenience

### **SECTION 007213 - GENERAL CONDITIONS**

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

# **ARTICLE 1 – GENERAL PROVISIONS**

### **ARTICLE 1.1 - DEFINITIONS**

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

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

- 8. "INCIDENTAL JOB BURDENS": Shall mean those expenses relating to the cost of work, incurred either in the home office or on the job-site, which are necessary in the course of doing business but are incidental to the job. Such costs include office supplies and equipment, postage, courier services, telephone expenses including long distance, water and ice and other similar expenses.
- 9. "JOINT VENTURE": An association of two (2) or more businesses to carry out a single business enterprise for profit for which purpose they combine their property, capital, efforts, skills and knowledge.
- 10. **"OWNER"**: Whenever the term "Owner" is used, it shall mean the State of Missouri.
- 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 Documents, Bidders. Bid 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"**: Labor, material, supplies, plant and equipment required to perform and complete the service agreed to by the Contractor 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 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 <u>applicable</u> laws, ordinances, rules and regulations that pertain to the work of this contract.
B. Contractors, subcontractors and their employees

construction permits or any other licenses (other

- B. Contractors, subcontractors and their employees engaged in the businesses of electrical, mechanical, plumbing, carpentry, sprinkler system work, and other construction related trades shall be licensed to perform such work by the municipal or political subdivision where the project is located, if such licensure is required by local code. Local codes shall dictate the level (master, journeyman, and apprentice) and the number, type and ratio of licensed tradesmen required for this project within the jurisdiction of such municipal or political subdivision.
- C. Equipment and controls manufacturers and their authorized service and installation technicians that do not maintain an office within the jurisdiction of the municipal or political subdivision but are a listed or specified contractor or subcontractor on this project are exempt from Paragraph 1.3 B above.
- D. The Contractor shall post a copy of the wage determination issued for the project and included as a part of the contract documents, in a prominent and easily accessible location at the site of construction for the duration of the project.
- E. Any contractor or subcontractor to such contractor at any tier signing a contract to work on this project shall provide a ten-hour Occupational Safety and Health Administration (OSHA) construction safety program for their on-site employees which includes a course in construction safety and health approved by OSHA or a similar program approved by the Department of Labor and Industrial Relations which is at least as stringent as an approved OSHA program. The contractor shall forfeit as a penalty to the public body on whose behalf the contract is made or awarded, two thousand five hundred dollars plus one hundred dollars for each employee employed by the contractor or subcontractor, for each calendar day, or portion thereof, such employee is employed without the required training.

# ARTICLE 1.4 - NONDISCRIMINATION IN EMPLOYMENT

A. The Contractor and his subcontractors will not discriminate against individuals based on race,

color, religion, national origin, sex, disability, or age, but may use restrictions which relate to bona fide occupational qualifications. Specifically, the Contractor and his subcontractors shall not discriminate:

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

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

- B. The Contractor and his subcontractors shall develop, implement, maintain and submit in writing to the Owner an affirmative action program if at least fifty (50) persons in the aggregate are employed under this contract. If less than fifty (50) persons in the aggregate are to be employed under this contract, the Contractor shall submit, in lieu of the written affirmative action program, a properly executed Affidavit for Affirmative Action in the form included in the contract specifications. For the purpose of this section, an "affirmative action program" means positive action to influence all employment practices (including, but not limited to, recruiting, hiring, promoting and training) in providing equal employment opportunity regardless of race, color, sex, national origin, religion, age (where the person affected is between age 40 and 70), disabled and Vietnam-era veteran status, and disability. Such "affirmative action program" shall include:
  - 1. A written policy statement committing the total organization to affirmative action and

assigning management responsibilities and procedures for evaluation and dissemination;

- 2. The identification of a person designated to handle affirmative action;
- 3. The establishment of non-discriminatory selection standards, objective measures to analyze recruitment, an upward mobility system, a wage and salary structure, and standards applicable to lay-off, recall, discharge, demotion and discipline;
- 4. The exclusion of discrimination from all collective bargaining agreements; and
- 5. Performance of an internal audit of the reporting system to monitor execution and to provide for future planning.

In the enforcement of this non-discrimination clause, the Owner may use any reasonable procedures available, including, but not limited to: requests, reports, site visits and inspection of relevant documents of contractors and subcontractors.

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

# ARTICLE 1.5 - ANTI-KICKBACK

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

### **ARTICLE 1.6 - PATENTS AND ROYALTIES**

- A. The Contractor shall hold and save the Owner and its officers, agents, servants and employees harmless from liabilities of any nature or kind, including cost and expenses, for, or on account of, any patented or unpatented invention, process, article or appliance manufactured or used in the performance of this contract, including its use by the Owner, unless otherwise specifically stipulated in the contract documents.
- B. If the Contractor uses any design, device or materials covered by letters, patent or copyright,

the Contractor shall provide for such use by suitable agreement with the Owner of such patented or copyrighted design, device or material. It is mutually agreed and understood, without exception, that the contract prices shall include all royalties or costs arising from the use of such design, device or materials, in any way involved in the work. The Contractor and/or his sureties shall indemnify and save harmless the Owner of the project from any and all claims for infringement by reason of the use of such patented or copyrighted design, device or materials or any trademark or copyright in connection with work agreed to be performed under this contract and shall indemnify the Owner for any cost, expense or damage it may be obliged to pay by reason of such infringement at any time during the prosecution of the work or after completion of the work.

### ARTICLE 1.7 - PREFERENCE FOR AMERICAN AND MISSOURI PRODUCTS AND SERVICES

- A. By virtue of statutory authority a preference will be given to Missouri labor and to products of mines, forests and quarries of the state of Missouri when they are found in marketable quantities in the state, and all such materials shall be of the best quality and suitable character that can be obtained at reasonable market prices, all as provided for in Section 8.280, Missouri Revised Statutes and Cumulative Supplements.
- B. Furthermore, pursuant to Section 34.076 Missouri Revised Statutes and Cumulative Supplements, a preference shall be given to those persons doing business as Missouri firms, corporations, or individuals, or which maintain Missouri offices or places of business, when the quality of performance promised is equal or better and the price quoted is the same or less. In addition, in order for a non-domiciliary bidder to be successful, his bid must be that same percentage lower than a domiciliary Missouri bidder's bid, as would be required for a Missouri bidder to successfully bid in the non-domiciliary state.
- In accordance with the Missouri Domestic С 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 onsite 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, insufficient maintenance, improper or improper operation, or normal wear and tear under normal usage. If required by the Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment
- B. Extended Warranty

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

#### ARTICLE 3.5 -- OPERATION AND MAINTENANCE MANUALS

- A. Immediately after equipment submittals are approved and no later than ten (10) working days prior to the substantial completion inspection, the Contractor shall provide to the Designer three (3) copies of operating instructions and service manuals, containing the following:
  - 1. Start-up and Shut-down Procedures: Provide a step-by-step write up of all major equipment. When manufacturer's printed start-up, trouble shooting and shut-down procedures are available; they may be incorporated into the operating manual for reference.
  - 2. Operating Instructions: Written operating instructions shall be included for the efficient and safe operation of all equipment.
  - 3. Equipment List: List of all major equipment as installed shall be prepared to include model number, capacities, flow rate, name place data, shop drawings and air and water balance reports.
  - 4. Service Instructions: Provide the following information for all pieces of equipment.
    - a. Recommended spare parts including catalog number and name of local supplier or factory representative.
    - b. Belt sizes, types, and lengths.
    - c. Wiring diagrams.
  - 5. Manufacturer's Certificate of Warranty as described in Article 3.4.
  - 6. Prior to the final payment, furnish to the Designer three (4) copies of parts catalogs for each piece of equipment furnished by him/her on the project with the components identified by number for replacement ordering.
- B. Submission of operating instructions shall be done in the following manner.
  - 1. Manuals shall be in quadruplicate, and all materials shall be bound into volumes of standard 8½" x 11" hard binders. Large drawings too bulky to be folded into 8½" x 11" shall be separately bound or folded and in envelopes, cross referenced and indexed with the manuals.
  - 2. The manuals shall identify project name, project number, and include the name and

address of the Contractor, subcontractors and manufacturers who were involved with the activity described in that particular manual.

- 3. Internally subdivide the binder contents with permanent page dividers, logically organized with tab titles clearly printed under reinforced laminated plastic tabs.
- 4. Contents: Prepare a Table of Contents for each volume, with each product or system description identified.

#### ARTICLE 3.6 – OTHER CONTRACTOR RESPONSIBILITIES

- A. The Contractor shall keep on site, during progress of the work, a competent superintendent satisfactory to the Construction Representative. The superintendent shall represent the Contractor and all agreements made by the superintendent shall be binding. The superintendent shall carefully study and compare all drawings, specifications and other instructions and shall promptly notify the Construction Representative and Designer, in writing, any error, inconsistency or omission which may be discovered. The superintendent shall coordinate all work on the project. Any change of the superintendent shall be approved by the Construction Representative.
- B. Contractor shall, at all times, enforce strict discipline and good order among his employees, and shall not employ on the work any unfit person or anyone not skilled in the work assigned to him/her.
- C. The Contractor shall supply sufficient labor, material, plant and equipment and pay when due any laborer, subcontractor or supplier for supplies furnished and otherwise prosecute the work with diligence to prevent work stoppage and insure completion thereof within the time specified.
- D. The Contractor and each of his subcontractors shall submit to the Construction Representative, through the Designer such schedules of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data as the Owner may request concerning work performed or to be performed under this contract.
- E. The Contractor, subcontractors, and material suppliers shall upon written request, give the Owner access to all time cards, material invoices, payrolls, estimates, profit and loss statements, and all other direct or indirect costs related to this work.
- F. The Contractor shall be responsible for laying out all contract work such as layout of architectural, structural, mechanical and electrical work, which shall be coordinated with layouts of subcontractors

for general construction work. The Contractor is also responsible for unloading, uncrating and handling of all materials and equipment to be erected or placed by him/her, whether furnished by Contractor or others. No extra charges or compensation will be allowed as a result of failure to verify dimensions before ordering materials or fabricating items.

- G. The Contractor must notify the Construction Representative at least one working day before placing concrete or burying underground utilities, pipelines, etc.
- H. Contractors shall prearrange time with the Construction Representative for the interruption of any facility operation. Unless otherwise specified in these documents, all connections, alterations or relocations as well as all other portions of the work will be performed during normal working hours.
- The Contractor shall coordinate all work so there I. 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

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.

services, applicable taxes of every nature, and all

other facilities necessary for the proper execution

drawings and shall be responsible for the proper

fitting of his material, equipment and apparatus

overload, or permit others to overload, any part of

any structure during the performance of this

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

M. Contractor shall carefully examine the plans and

N. The Contractor or subcontractors shall not

O. All temporary shoring, bracing, etc., required for

and completion of the work.

into the building.

contract.

supports.

- 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.
- The Contractor shall be responsible for care of the S. 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 with the drawings in accordance 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 negotiated, and may vary according to the nature, extent, and complexity of the work involved. However, the overhead and profit for the Contractor or subcontractor actually performing the work shall not exceed 14%. When one or more tiers of subcontractors are used, in no event shall any Contractor or subcontractor receive as overhead and profit more than 3% of the cost of the work performed by any of his subcontractors. In no case shall the total overhead and profit paid by the Owner on any Contract Changes exceed twenty percent (20%) 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 bonding and insurance to their cost of work. This bonding and insurance cost shall not exceed 2% and shall be allowed on the total cost of the added work, including overhead and profit.
- 4. On proposals covering both increases and decreases in the amount of this contract, the application of overhead and profit shall be on the net change in the cost of the work.
- 5. The percentage 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 negotiated, and may vary according to the nature, extent and complexity of the work involved, but in no case shall be less than ten percent (10%). If the percentage for overhead and profit charged for work added by Contract Changes for this contract has been negotiated to less than 10%, the negotiated rate shall then apply to credits as well.
- 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.
  - 4. Written Affirmative Action Plans as required in Article 1.4.

Above referenced items must be received by the Owner within ten (10) working days after the effective date of the contract. If not received, the Owner may treat the failure to timely submit them as a refusal by the Contractor to accept a contract for this work and may retain as liquidated damages the Contractor's bid bond, cashier's check or certified check as provided in the Instructions to Bidders. Upon receipt the Owner will issue a "Notice to Proceed" with the work to the Contractor.

B. Within the time frame noted in Section 013200 -Schedules, following receipt of the "Notice to Proceed", the Contractor shall submit to the Owner a progress schedule and schedule of values, showing activities through the end of the contract period. Should the Contractor not receive written notification from the Owner of the disapproval of the schedule of values within fifteen (15) working days, the Contractor may consider it approved for purpose of determining when the first monthly Application and Certification for Payment may be submitted.

C. The Contractor may commence work upon receipt of the Division of Facilities Management, Design and Construction's "Notice to Proceed" letter. Contractor shall prosecute the work with faithfulness and energy, and shall complete the entire work on or before the completion time stated in the contract documents or pay to the Owner the damages resulting from the failure to timely complete the work as set out within Article 5.4.

#### **ARTICLE 5.2 -- PROJECT CONSTRUCTION**

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

#### **ARTICLE 5.3 -- PROJECT COMPLETION**

- A. Substantial Completion. A Project is substantially complete when construction is essentially complete and work items remaining to be completed can be done without interfering with the Owner's ability to use the Project for its intended purpose.
  - 1. Once the Contractor has reached what they believe is Substantial Completion, the Contractor shall notify the Designer and the Construction Representative of the following:
    - a. That work is essentially complete with the exception of certain listed work items. The list shall be referred to as the "Contractor's Punch."
    - b. That all Operation and Maintenance Manuals have been assembled and submitted in accordance with Article 3.5A.
    - c. That the Work is ready for inspection by the Designer and Construction Representative. The Owner shall be entitled to a minimum of ten working

days notice before the inspection shall be performed.

- 2. If the work is acceptable, the Owner shall issue a Certificate of Substantial Completion, which shall set forth the responsibilities of the Owner and the Contractor for utilities, security, maintenance, damage to the work and risk of loss. The Certificate shall also identify those remaining items of work to be performed by the Contractor. All such work items shall be complete within 30 working days of the date of the Certificate, unless the Certificate specifies a different time. If the Contractor shall be required to perform tests that must be delayed due to climatic conditions, it is understood that such tests and affected equipment will be identified on the Certificate and shall be accomplished by the Contractor at the earliest possible date. Performance of the tests may not be required before Substantial Completion can be issued. The date of the issuance of the Certificate of Substantial Completion shall determine whether or not the work was completed within the contract time and whether or not Liquidated Damages are due.
- 3. If the work is not acceptable, and the Owner does not issue a Certificate of Substantial Completion, the Owner shall be entitled to charge the Contractor with the Designer's and Owner's costs of re-inspection, including time and travel.
- B. Partial Occupancy. Contractor agrees that the Owner shall be permitted to occupy and use any completed or partially completed portions of the Project, when such occupancy and use is in the Owner's best interest. Owner shall notify Contractor of its desire and intention to take Partial Occupancy as soon as possible but at least ten (10) working days before the Owner intends to occupy. If the Contractor believes that the portion of the work the Owner intends to occupy is not ready for occupancy, the Contractor shall notify the Owner immediately. The Designer shall inspect the work in accordance with the procedures above. If the Contractor claims increased cost of the project or delay in completion as a result of the occupancy, he shall notify the Owner immediately but in all cases before occupancy occurs.
- C. Final Completion. The Project is finally complete when the Certificate of Substantial Completion has been issued and all work items identified therein as incomplete have been completed, and when all administrative items required by the contract have been completed. Final Completion entitles the Contractor to payment of the outstanding balance of the contract amount including all change orders

SECTION 007213 - GENERAL CONDITIONS 8/21

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 Risk Reporting-Builder's 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 selfinsured 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 nonpayment 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:
  - If the Contractor shall file for bankruptcy, or 1. 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:	Darren Krehbiel DARREN KREHBIEL CONSULTANTS, LLC PO Box 587 Camdenton, MO 65020 Telephone: 573-346-5316 Email: <u>krehbiel.darren@gmail.com</u>
Construction Representative:	Brandon Dorge Division of Facilities Management, Design and Construction 709 Missouri BLVD Jefferson City, MO 65101 Telephone: 573-522-5645 Email: <u>Brandon.Dorge@oa.mo.gov</u>
Project Manager:	Eric Hibdon Division of Facilities Management, Design and Construction 301 West High Street, Room 730 Jefferson City, Missouri 65102 Telephone: 573-522-0322 Email: Eric.Hibdon@oa.mo.gov
Contract Specialist:	Mandy Roberson Division of Facilities Management, Design and Construction 301 West High Street, Room 730 Jefferson City, Missouri 65102 Telephone: 573-522-0074 Email: <u>Mandy.Roberson@oa.mo.gov</u>

### 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 3 complete sets of drawings and specifications at no charge.
- B. The Owner will furnish the Contractor with approximately 3 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. 28**

### Section 015 CAMDEN 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

Taylor Burks, Director Division of Labor Standards

Filed With Secretary of State:

March 10, 2021

Last Date Objections May Be Filed: April 8, 2021

Prepared by Missouri Department of Labor and Industrial Relations

### Building Construction Rates for CAMDEN County

	**Prevailing
OCCUPATIONAL TITLE	Hourly
	Rate
Asbestos Worker	*\$21.72
Boilermaker	*\$21.72
Bricklaver	*\$21.72
Carpenter	\$52.31
Lather	
Linoleum Laver	
Millwright	
Pile Driver	
Cement Mason	*\$21 72
Plasterer	ΨE 1.1 E
Communications Technician	*\$21.72
Electrician (Inside Wireman)	\$63.27
Electrician Outside Lineman	*\$21.72
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Elevator Constructor	*\$21.72
Glazier	*\$21.72
	*\$21.72
Laborer	\$44 71
General Laborer	<b></b>
First Semi-Skilled	
Second Semi-Skilled	
Mason	*\$21.72
Marble Mason	
Marble Finisher	
Terrazzo Worker	
Terrazzo Finisher	
Tile Setter	
Tile Finisher	
Operating Engineer	*\$21.72
Group I	
Group II	
Group III	
Group III-A	
Group IV	
Group V	
Painter	\$43.01
Plumber	\$64.24
Pipe Fitter	
Roofer	*\$21.72
Sheet Metal Worker	\$53.76
Sprinkler Fitter	*\$21.72
Truck Driver	*\$21.72
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

\*The Division of Labor Standards received less 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.

## Heavy Construction Rates for CAMDEN County

	**Prevailing
OCCUPATIONAL TITLE	Hourly
	Rate
Carpenter	*\$21.72
Millwright	
Pile Driver	
Electrician (Outside Lineman)	*\$21.72
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Laborer	\$40.49
General Laborer	
Skilled Laborer	
Operating Engineer	\$47.68
Group I	
Group II	
Group III	
Group IV	
Truck Driver	*\$21.72
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 less than 1,000 reportable hours for this occupational title. Public works contracting minimum wage is established for this occupational title using data provided by Missouri Economic Research and Information Center.

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

### OVERTIME and HOLIDAYS

### OVERTIME

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

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

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

### HOLIDAYS

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

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

#### SECTION 011000 – SUMMARY OF WORK

#### PART 1 - GENERAL

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 WORK COVERED BY CONTRACT DOCUMENTS**

- A. The X1807-01 Project includes Water System Improvements to the Bennett Spring State Park, and consists of highway road bores, wet taps, waterline connection to Laclede PWSD #1 along with new meter, pressure reducing valves, backflow prevention, main valve arrangement with pressure sustaining valve, a booster station, and the construction of water lines; complete with appurtenances, disinfection, a tracer wire system, plus pressure and leakage tests.
  - 1. Project Location: Bennett Spring State Park, 29250 Hwy 64A, Lebanon, MO 65536.
  - 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 April 20, 2022 were prepared for the Project by P.E. Darren Krehbiel of Darren Krehbiel Consultants LLC, PO Box 587, Camdenton, MO 65020 (Phone #573-346-5316).
- C. The Work will be constructed under a single prime contract.

#### **1.3** ACCEPTANCE OF WORK

A. Upon completion of all operations, the Contractor shall request the Owner's Representative to perform an inspection for acceptance. All work must be completed in strict accordance with Plans and Specifications prior to final acceptance.

Where, in the opinion of the Owner's Representative, inspected work does not comply with the requirements of the Plans and Specifications, the Contractor shall replace rejected work at no additional cost to the Owner.

B. The one-year warranty period required by Section 007213 – General Conditions, Article 3.4 – Guaranty and Warranties is required for this project.

#### **1.4 WORK UNDER OTHER CONTRACTS**

- A. General: Where applicable, cooperate fully with separate Contractors so that their work on other contracts may be carried out smoothly; and coordinate closely with other Contractors to ensure that their work does not interfere or delay the work of this Contract. Coordinate the Work of this Contract to have primacy and thereby avoid any potential delays that could be causes by work performed under separate contracts.
- B. Preceding Work: None known at this time.

- C. Concurrent Work: None known at this time.
- D. Future Work: None known at this time.

#### 1.5 SOLE SOURCE SERVICE AND/OR PRODUCTS

A. Not Used.

#### **1.6 USE OF PREMISES**

- A. General: Contractor's use of premises is limited by Owner's right to perform work or to retain other contractors on portions of Project.
- B. General: Contractor shall have limited use of premises for construction operations as indicated on Drawings by the Contract limits.
- C. Use of Site: Do not disturb portions of Project site beyond areas in which the Work is indicated.
  - 1. Owner Occupancy: Allow for Owner occupancy of Project site. Subparagraph and associated subparagraphs below are examples of a special requirement appropriate to many projects. Revise to suit Project or delete.
  - 2. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize use of driveways and entrances.
    - a. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- D. Use of Existing Building: Maintain existing building in a weather tight condition throughout construction period. Repair damage caused by construction operations. Protect building and its occupants during construction period.

#### 1.7 OWNER'S OCCUPANCY REQUIREMENTS

- A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits, unless otherwise indicated.
  - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
- B. Owner Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed areas before Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and partial occupancy shall not constitute acceptance of the total Work.
  - 1. Designer will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied before Owner occupancy.
  - 2. Obtain a Certificate of Occupancy from authorities having jurisdiction before Owner occupancy.

3. Before partial Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed.

#### **1.8 WORK RESTRICTIONS**

- A. On-Site Work Hours: Work shall be generally performed during normal business working hours of 7:00 a.m. to 7:00 p.m., Monday through Friday, except otherwise indicated.
  - 1. Weekend Hours: Weekend work shall be permitted as approved by park staff, which shall not be unreasonably withheld.
  - 2. Early Morning Hours: Early Morning Hours shall be permitted as approved by park staff, which shall not be unreasonably withheld.
  - 3. Hours for Utility Shutdowns: Utility shutdowns shall be during normal business hours with 72 hours' notice.
  - 4. Hours for noisy activity: Noisy activity shall be permitted as approved by park staff, which shall not be unreasonably withheld.
- B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
  - 1. Notify **Owner** not less than 72 hours in advance of proposed utility interruptions.
  - 2. Do not proceed with utility interruptions without **Owner's** written permission.

#### **1.9 SPECIFICATION FORMATS AND CONVENTIONS**

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 50-division format and CSI/CSC's "MasterFormat" numbering system.
  - 1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.
  - 2. Division 01: Sections in Division 01 govern the execution of the Work of all Sections in the Specifications.
- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
  - 1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
  - 2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
    - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

PART 2 - PRODUCTS (Not Used)

#### PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

#### **SECTION 012100 - ALLOWANCES**

#### PART 1 - GENERAL

#### **1.1 RELATED DOCUMENTS**

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 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.
  - 2. Sole Source allowance.
- C. Related Sections include the following:
  - 1. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders for allowances.

#### **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's 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.
- F. Weather Allowance: Included within the completion period for this Project are Fifteen (15) "bad weather" days.

#### **1.4 SOLE SOURCE ALLOWANCE**

A. Not Used.

#### END OF SECTION 012100

#### **SECTION 012300 - ALTERNATES**

#### PART 1 - GENERAL

#### **1.1 RELATED DOCUMENTS**

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

#### 1.2 SUMMARY

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

#### **1.3 DEFINITIONS**

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

#### **1.4 PROCEDURES**

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

#### PART 2 - PRODUCTS (Not Applicable)

#### **PART 3 - EXECUTION**

#### **3.1 SCHEDULE OF ALTERNATES**

- A. Alternate No. 1: Add a booster pump station as indicated on Drawing C-303 and as specified in Division 22 Section 221123.13 Booster Pump.
- B. Alternate No. 2: *Add water line as indicated on Drawing C-307.*

#### END OF SECTION 012300

ALTERNATES PROJECT NO. X1807-01

#### SECTION 012600 – CONTRACT MODIFICATION PROCEDURES

#### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract Modifications.
- B. Related Sections include the following:
  - 1. Division 1, Section 012100 "Allowances" for procedural requirements for handling and processing Allowances.
  - 2. Division 1, Section 012200 "Unit Prices" for administrative requirements for using Unit Prices.
  - 3. Division 1, Section 013115 "Project Management Communications" for administrative requirements for communications.
  - 4. Division 0, Section 007213, Article 3.1 "Acceptable Substitutions" for administrative procedures for handling Requests for Substitutions made after Contract award.
  - 5. Division 0, Section 007213, Article 4.0 "Changes in the Work" for Change Order requirements.

#### **1.3 REQUESTS FOR INFORMATION**

- A. In the event that the Contractor or Subcontractor, at any tier, determines that some portion of the Drawings, Specifications, or other Contract Documents requires clarification or interpretation, the Contractor shall submit a "Request for Information" (RFI) in writing to the Designer. A RFI may only be submitted by the Contractor and shall only be submitted on the RFI forms provided by the Owner. The Contractor shall clearly and concisely set forth the issue for which clarification or interpretation is sought and why a response is needed. In the RFI, the Contractor shall set forth an interpretation or understanding of the requirement along with reasons why such an understanding was reached.
- B. Responses to RFI shall be issued within ten (10) working days of receipt of the Request from the Contractor unless the Designer determines that a longer time is necessary to provide an adequate response. If a longer time is determined necessary by the Designer, the Designer will, within five (5) working days of receipt of the request, notify the Contractor of the anticipated response time. If the 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**

#### END OF SECTION 012600

#### **SECTION 013100 – COORDINATION**

#### PART 1 - GENERAL

#### **1.1 RELATED DOCUMENTS**

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

#### 1.2 SUMMARY

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

#### 1.3 COORDINATION

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

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

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

#### 1.4 SUBMITTALS

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

#### **1.5 PROJECT MEETINGS**

A. The Owner's Construction Representative will schedule a Pre-Construction Meeting prior to beginning of construction. The date, time, and exact place of this meeting will be determined after Contract Award and notification of all interested parties. The Contractor shall arrange to have the Job Superintendent and all prime Subcontractors present at the meeting. During the Pre-Construction Meeting, the construction procedures and information necessary for submitting payment requests will be discussed and materials distributed along with any other pertinent information.

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

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

#### PART 2 - PRODUCTS (Not Used)

#### PART 3 - EXECUTION (Not Used)

#### END OF SECTION 013100

#### SECTION 013115 - PROJECT MANAGEMENT COMMUNICATIONS

#### PART 1 - GENERAL

#### **1.1 RELATED DOCUMENTS**

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

#### 1.2 SUMMARY

- A. Project Management Communications: The Contractor shall use the Internet web based project management communications tool, E-Builder<sup>®</sup> ASP software, and protocols included in that software during this project. The use of project management communications as herein described does not replace or change any contractual responsibilities of the participants.
  - 1. Project management communications is available through E-Builder<sup>®</sup> as provided by "e-Builder<sup>®</sup>" 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<sup>®</sup> 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<sup>®</sup> 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: <u>https://oa.mo.gov/facilities/vendor-links/contractor-forms</u>. Completed forms shall be emailed to the following email address: <u>OA.FMDCE-BuilderSupport@oa.mo.gov</u>.

- 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 <u>all posted items</u>. 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
- 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 subcontractors 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<sup>1</sup> with high-speed Internet access, i.e. DSL, local cable company's Internet connection, or T1 connection.

<sup>&</sup>lt;sup>1</sup> 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. Each of the above referenced computer systems shall have the following minimum system<sup>2</sup> and software requirements:
  - a. Desktop configuration (Laptop configurations are similar and should be equal to or exceed desktop system.)
    - 1) Operating System: Windows XP or newer
    - 2) Internet Browser: Internet Explorer 6.01SP2+ (Recommend IE7.0+)
    - 3) Minimum Recommend Connection Speed: 256K or above
    - 4) Processor Speed: 1 Gigahertz and above
    - 5) RAM: 512 mb
    - 6) Operating system and software shall be properly licensed.
    - 7) Internet Explorer version 7 (current version is a free distribution for download). This specification is not intended to restrict the host server or client computers provided that industry standard HTTP clients may access the published content.
    - 8) Adobe Acrobat Reader (current version is a free distribution for download).
    - 9) Users should have the standard Microsoft Office Suite (current version must be purchased) or the equivalent.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable.)

END OF SECTION 013115

<sup>&</sup>lt;sup>2</sup> The minimum system herein will <u>not be sufficient</u> for many tasks and may not be able to process all documents and files stored in the E-Builder® Documents area.

#### **SECTION 013200 – SCHEDULE – BAR CHART**

#### PART 1 - GENERAL

#### **1.1 RELATED DOCUMENTS**

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

#### 1.2 SUMMARY

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

#### **PART 2 - PRODUCTS – (Not Applicable)**

#### PART 3 - EXECUTION

#### 3.1 SUBMITTAL PROCEDURES

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

## **3.2** CONSTRUCTION PROGRESS SCHEDULE – BAR CHART SCHEDULE

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

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

#### **3.3 SCHEDULE OF SUBMITTALS**

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

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

# **3.4 SCHEDULE OF INSPECTIONS AND TESTS**

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

#### **SECTION 013300 – SUBMITTALS**

#### PART 1 - GENERAL

#### **1.1 RELATED DOCUMENTS**

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

#### 1.2 SUMMARY

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

#### **1.3 SUBMITTAL PROCEDURES**

A. The Contractor shall comply with the General and Supplementary Conditions and other applicable sections of the Contract Documents. The Contractor shall submit, with such promptness as to cause no delay in his work or in that of any other contractors, all required submittals indicated in Part 3.1 of this section and elsewhere in the Contract Documents. Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

- 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
- 2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
  - a. The Designer reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.
- B. Each drawing and/or series of drawings submitted must be accompanied by a letter of transmittal giving a list of the titles and numbers of the drawings. Each series shall be numbered consecutively for ready reference and each drawing shall be marked with the following information:
  - 1. Date of Submission.
  - 2. Name of Project.
  - 3. Location.
  - 4. Section Number of Specification.
  - 5. State Project Number.
  - 6. Name of Submitting Contractor.
  - 7. Name of Subcontractor.
  - 8. Indicate if item is submitted as specified or as a substitution.

### **1.4 SHOP DRAWINGS**

- A. Comply with the General Conditions, Article 3.2.
- B. The Contractor shall submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.
- C. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include 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 8-1/2 by 11 inches but no larger than 36 by 48 inches.

# **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. Include 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. Include 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 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 on-site 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 two sets of prints, black and white, glossy; 8 X 10 inch size; mounted on 8-1/2 X 11 inch soft card stock, with left edge binding margin for three hole punch.
  - 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 week prior to submitting.
  - 4. The Contractor shall take four site photographs from differing directions and a minimum of five 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 and this and other sections of the Contract Documents.

#### PART 2 - PRODUCTS (Not Applicable)

#### PART 3 - EXECUTION

#### **3.1 REQUIRED SUBMITTALS**

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

SPEC SECTION	TITLE	CATEGORY
013200	Schedules	Construction Schedule
013200	Schedules	Schedule of Values
013200	Schedules	List of Subcontractors
013200	Schedules	Major Material Suppliers
025100	Fittings	Product Data
025100	Meter and Box	Product Data
025100	PVC Pipe	Product Data
025100	Valves	Product Data
025100	Pressure Reducing Valve	Product Data
025100	Pressure Sustaining Valve	Product Data
029250	Seed	Product Data
029250	Mulch	Product Data
032111	Steel Reinforcing Bars	Product Data
033053	Concrete	Product Data
221123.13	Pumps	Product Data
221123.13	Enclosure and Appurtenances	Product Data
260500	Electrical	Product Data
317119	Casing	Product Data
321123	Base	Product Data
321200	Asphalt Mix	Product Data
331116.11	Tracer Wire	Product Data

# SECTION 013513.31 – SITE SECURITY AND HEALTH REQUIREMENTS (DNR)

### PART 1 - GENERAL

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUBMITTALS**

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

#### PART 2 - PRODUCTS (Not Applicable)

#### PART 3 - EXECUTION

### **3.1** ACCESS TO THE SITE

- A. The Contractor shall arrange with Facility Representatives to establish procedures for the controlled entry of workers and materials into the work areas at the Facility.
- B. The Contractor shall establish regular working hours with Facility Representatives. The Contractor must report changes in working hours or overtime to Facility Representatives and obtain approval twenty-four (24) hours ahead of time. The Contractor shall report emergency overtime to Facility Representatives as soon as it is evident that overtime is needed. The Contractor must obtain approval from Facility Representatives for all work performed after dark.
- C. The Contractor shall provide the name and phone number of the Contractor's employee or agent who is in charge onsite; this individual must be able to be contacted in case of emergency. The Contractor must be able to furnish names and address of all employees upon request.
- D. 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.
  - Onsite burning is prohibited; unless specifically allowed elsewhere in the Project Specs, by Local Governing Officials, and by the Owner's Representative; and even when allowed to burn onsite the Contractor remains responsible at all times for observing red flag warnings (<u>https://dfs.dps.mo.gov/programs/resources/county-burn-bans.php</u>), providing continuous watch and control of all fires, and financial responsibility for the repair of any related damages caused by uncontrolled burning.
  - 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 013513.31

# SECTION 015000 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

## PART 1 - GENERAL

#### **1.1 RELATED DOCUMENTS**

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

#### 1.2 SUMMARY

- A. This Section includes requirements for construction facilities and temporary controls including temporary utilities, support facilities, security, and protection.
- B. Temporary utilities include, but are not limited to, the following:
  - 1. Water service and distribution
  - 2. Temporary electric power and light
  - 3. Temporary heat
  - 4. Ventilation
  - 5. Telephone service
  - 6. Sanitary facilities, including drinking water
  - 7. Storm and sanitary sewer
- C. Support facilities include, but are not limited to, the following:
  - 1. Field offices and storage sheds
  - 2. Temporary roads and paving
  - 3. Dewatering facilities and drains
  - 4. Temporary enclosures
  - 5. Hoists and temporary elevator use
  - 6. Temporary project identification signs and bulletin boards
  - 7. Waste disposal services
  - 8. Rodent and pest control
  - 9. Construction aids and miscellaneous services and facilities
- D. Security and protection facilities include, but are not limited to, to following:
  - 1. Temporary fire protection
  - 2. Barricades, warning signs, and lights
  - 3. Sidewalk bridge or enclosure fence for the site
  - 4. Environmental protection
- E. The Contractor shall provide the Owner a minimum of 1-week prior written notice of any and all interruptions to water service.
  - 1. Water service interruption(s) shall not exceed 24 hours in duration in each instance, without prior written approval from the Owner.

- 2. There shall be no planned water service interruptions one-day preceding, on the day of, or one-day following any State holidays (<u>https://oa.mo.gov/commissioner/state-holidays</u>).
- 3. The Contractor shall (where possible) schedule all planned service interruptions to occur at the beginning of the work week.
- 4. The work week is generally defined to begin on Monday morning.

### **1.3 SUBMITTALS**

- A. Temporary Utilities: Submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.
- B. Implementation and Termination Schedule: Within (15) days of the date established for commencement of the Work, submit a schedule indicating implementation and termination of each temporary utility.

#### 1.4 QUALITY ASSURANCE

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

#### **1.5 PROJECT CONDITIONS**

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

### **PART 2 - PRODUCTS**

#### 2.1 MATERIALS

- A. General: Provide new materials. If acceptable to the Designer, the Contractor may use undamaged, previously used materials in serviceable condition. Provide materials suitable for use intended.
- B. Lumber and Plywood: Comply with requirements in Division 6 Section "Rough Carpentry".
  - 1. For job-built temporary office, shops, and sheds within the construction area, provide UL-labeled, fire-treated lumber and plywood for framing, sheathing, and siding.
  - 2. For signs and directory boards, provide exterior-type, Grade B-B high-density concrete form overlay plywood of sized and thicknesses indicated.
  - 3. For fences and vision barriers, provide minimum 3/9" (9.5mm) thick exterior plywood.
  - 4. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8" (16mm) thick exterior plywood.
- C. Gypsum Wallboard: Provide gypsum wallboard on interior walls of temporary offices.
- D. Roofing Materials: Provide UL Class A standard-weight asphalt shingles or UL Class C mineral-surfaced roll roofing on roofs of job-built temporary office, shops, and shed.
- E. Paint: Comply with requirements of Division 9 Section "Painting".
  - 1. For job-built temporary offices, shops, sheds, fences, and other exposed lumber and plywood, provide exterior-grade acrylic-latex emulsion over exterior primer.
  - 2. For sign panels and applying graphics, provide exterior-grade alkyd gloss enamel over exterior primer.
  - 3. For interior walls of temporary offices, provide two (2) quarts interior latex-flat wall paint.
- F. Tarpaulins: Provide waterproof, fire-resistant, UL-labeled tarpaulins with flame-spread rating of (15) or less. For temporary enclosures, provide translucent, nylon-reinforced laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.
- G. Water: Provide potable water approved by local health authorities.
- H. Open-Mesh Fencing: Provide 0.120" (3mm) thick, galvanized 2" (50mm) chainlink fabric fencing 6' (2m) high with galvanized steel pipe posts, 1<sup>1</sup>/<sub>2</sub>" (38mm) ID for line posts and 2<sup>1</sup>/<sub>2</sub>" (64mm) ID for corner posts.

#### 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 <sup>3</sup>/<sub>4</sub>" (19mm), heavy-duty, abrasion-resistant, flexible rubber hoses 100' (30m) long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.

- C. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110 to 120V plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.
- D. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage rating.
- E. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered-glass enclosures where exposed to breakage. Provide exterior fixture where exposed to moisture.
- F. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM, or another recognized trade association related to the type of fuel being consumed.
- G. Temporary Offices: Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows, and serviceable finishes. Provide heated and air-conditioned units on foundations adequate for normal loading.
- H. Temporary Toilet Units: Provide self-contained, single-occupant toilet units of the chemical, aerated re-circulation, or combustion type. Provide units properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
- I. Fire Extinguishers: Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers, or a combination of extinguishers of NFPA-recommended classes for the exposures.
  - 1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

# PART 3 - EXECUTION

# 3.1 INSTALLATION

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

### **3.2 TEMPORARY UTILITY INSTALLATION**

- A. General: Engage the appropriate local utility company to install temporary service or connect to existing service. Where company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with company recommendations.
  - 1. Arrange with company and existing users for a time when service can be interrupted, if necessary, to make connections for temporary services.

- 2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.
- 3. Obtain easements to bring temporary utilities to the site where the Owner's easements cannot be used for that purpose.
- 4. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Designer. Neither the Owner nor Designer will accept cost or use charges as a basis of claims for Change Order.
- B. Temporary Water Service: The Owner will provide water for construction purposes from the existing building system. All required temporary extensions shall be provided and removed by the Contractor. Connection points and methods of connection shall be designated and approved by the Construction Representative.
- C. Temporary Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload-protected disconnects, automatic ground-fault interrupters, and main distribution switch gear.
  - 1. Install electric power service underground, except where overhead service must be used.
  - 2. Power Distribution System: Install wiring overhead and rise vertically where least exposed to damage. Where permitted, wiring circuits not exceeding 125V, AC 20ampere rating, and lighting circuits may be nonmetallic sheathed cable where overhead and exposed for surveillance.
- D. Temporary Lighting: When overhead floor or roof deck has been installed, provide temporary lighting with local switching.
  - 1. Install and operate temporary lighting that will fulfill security and protection requirements without operating the entire system. Provide temporary lighting that will provide adequate illumination for construction operations and traffic conditions.
- E. Temporary Toilets: Install self-contained toilet units. Use of pit-type privies will not be permitted. Comply with regulations and health codes for the type, number, location, operation, and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.
  - 1. Shield toilets to ensure privacy.
  - 2. Provide separate facilities for male and female personnel.
  - 3. Provide toilet tissue materials for each facility.
- F. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a health and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.
  - 1. Provide paper towels or similar disposable materials for each facility.
  - 2. Provide covered waste containers for used material.
  - 3. Provide safety showers, eyewash fountains, and similar facilities for convenience, safety, and sanitation of personnel.
- G. Drinking-Water Facilities: Provide drinking-water fountains where indicated, including paper cup supply.

- H. Drinking-Water Facilities: The Owner will provide drinking water facilities within the building. All construction personnel will be allowed access only to those specific facilities designated by the Construction Representative.
- I. Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rains.

## **3.3 SUPPORT FACILITIES INSTALLATION**

- A. General: Locate field offices, storage sheds, and other temporary construction and support facilities for easy access.
  - 1. Maintain support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.
- B. Field Offices: Provide insulated, weathertight temporary offices of sufficient size to accommodate required office personnel at the Project site. Keep the office clean and orderly for use for small progress meetings. Furnish and equip office as follows:
  - 1. Furnish with a desk and chairs, a 4-drawer file cabinet, plan table, plan rack, and a 6-shelf bookcase.
  - 2. Equip with a water cooler and private toilet complete with water closet, lavatory, and medicine cabinet unit with a mirror.
- C. Storage Facilities: 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.
- D. Temporary Paving: Construct and maintain temporary roads and paving to support the indicated loading adequately and to withstand exposure to traffic during the construction period. Locate temporary paving for roads, storage areas, and parking where the same permanent facilities will be located. Review proposed modifications to permanent paving with the Designer.
  - 1. Paving: Comply with Division 2 Section "Hot-Mixed Asphalt Paving" for construction and maintenance of temporary paving.
  - 2. Coordinate temporary paving development with subgrade grading, compaction, installation and stabilization of subbase, and installation of base and finish courses of permanent paving.
  - 3. Install temporary paving to minimize the need to rework the installations and to result in permanent roads and paved areas without damage or deterioration when occupied by the Owner.
  - 4. Delay installation of the final course of permanent asphalt concrete paving until immediately before Substantial Completion. Coordinate with weather conditions to avoid unsatisfactory results.
  - 5. Extend temporary paving in and around the construction area as necessary to accommodate delivery and storage of materials, equipment usage, administration, and supervision.

- E. Construction Parking: Parking at the site will be provided in the areas designated at the Pre-Construction Meeting.
- F. 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.
- G. 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.
- H. Temporary Exterior Lighting: Install exterior yard and sign lights so signs are visible when Work is being performed.
- I. 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.
- J. Rodent Pest Control: Before deep foundation work has been completed, retain a local exterminator or pest control company to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests. Employ this service to perform extermination and control procedures are regular intervals so the Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.

### **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. Enclosure Fence: Before excavation begins, install an enclosure fence with lockable entrance gates. Locate where indicated, or enclose the entire site or the portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs, and other animals from easily entering the site, except by the entrance gates.
  - 1. Provide open-mesh, chainlink fencing with posts set in a compacted mixture of gravel and earth.
  - 2. Provide plywood fence, 8' (2.5m) high, framed with (4) 2"x4" (50mm x 100mm) rails, and preservative-treated wood posts spaced not more than 8' (2.5m) apart.

- 3. 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.
- D. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted or that other undesirable effects might result. Avoid use of tools and equipment that produce harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near the site.

### 3.5 OPERATION, TERMINATION AND REMOVAL

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

# **SECTION 015526 - CONSTRUCTION AREA TRAFFIC CONTROL**

# PART 1 - GENERAL

### 1.1 DESCRIPTION

A. This section sets forth requirements concerning flagging and traffic-handling equipment and devices used in carrying out the Contractor's responsibility for public convenience and public safety.

### 1.2 GENERAL

A. Attention is directed to Section 616 of the (Missouri Standard Specifications for Highway Construction (M.S.S.H.C), 1999 Edition). The Contractor shall comply with all paragraphs of Section 616, except paragraph 616.4, and all related sections of the Missouri Standard Specifications.

#### 1.3 SUBMITTALS

A. The Contractor shall submit to the Owner's Representative or Designer a detailed plan of traffic control operations prior to execution for approval.

### PART 2 – PRODUCTS

#### 2.1 MATERIALS AND EQUIPMENT

- A. <u>Telescoping Flag Trees -</u> Telescoping flag trees shall be of good commercial quality material, suitable for the purpose intended and shall be capable of maintaining an upright position at all times while in use.
- B. <u>Traffic Cones -</u> Traffic cones shall be fluorescent and of good commercial quality, flexible material suitable for the purpose intended. The outer section of the portion above the base of the cone shall be a highly pigmented fluorescent orange polyvinyl compound. The overall height of the cone shall be at least 28 inches. The base shall be of sufficient weight and size or shall be anchored in a manner such that the traffic cone will remain in an upright position.

#### **PART 3 - EXECUTION**

- A. Traffic-handling equipment and devices damaged from any cause during the progress of the work shall be repaired, including painting if necessary, or replaced by the Contractor at his expense.
- B. When traffic control devices furnished by the Contractor are no longer needed for controlling traffic, they shall be removed from the site of the work.
- C. All construction area signs shall conform to the dimensions, color, legend and reflectorization or lighting requirements as directed by Owner's Representative or Designer. All sign panels shall be the product of a commercial sign manufacturer.
- D. The Contractor may be required to cover certain signs during the progress of the work. Covers for construction area signs shall be of sufficient size and density to completely block out the message so that it is not visible either during the day or night. Covers shall be fastened securely to prevent movement caused by wind action.

- E. The Contractor shall clean all construction area sign panels at the time of installation and as often thereafter as Owner's Representative or Designer determines to be necessary, but at least once every four (4) months.
- F. To properly provide for changing traffic conditions and damage caused by public traffic or otherwise, the Contractor shall be prepared to furnish on short notice additional construction area sign panels, post and mounting hardware or portable sign mounts. The Contractor shall maintain an inventory of the commonly required items at the job site or shall make arrangements with a supplier who is able, on a daily basis, to furnish such items on short notice.
- G. The Contractor shall so conduct his operations as to offer the least possible obstruction and inconvenience to the public and he shall have under construction no greater length or amount of work than he can prosecute properly with due regard to the rights of the public.
- H. Unless otherwise provided in the special provisions, all public traffic shall be permitted to pass through the work with as little inconvenience and delay as possible.
- I. Spillage resulting from hauling operations along or across any public traveled way shall be removed immediately by the Contractor at his expense.
- J. Existing traffic signal and highway lighting systems shall be kept in operation for the benefit of the traveling public during progress of the work, and other forces will continue routine maintenance of existing systems.
- K. Construction operations shall be conducted in such a manner as to cause as little inconvenience as possible to abutting property owners.
- L. Convenient access to driveways, houses, and buildings along the line of the work shall be maintained and kept in good condition.
- M. Whenever the Contractor's operations create a condition hazardous to traffic or to the public, he shall, at his expense and without cost to the Owner, furnish, erect and maintain such fences, temporary railing, barricades, lights, signs and other devices and take such other protective measures as are necessary to prevent accidents or damage or injury to the public. Such fences, temporary railing, barricades, lights, signs, and other devices furnished, erected and maintained by the Contractor, at his expense, are in addition to any construction area traffic control devices.
- N. The Contractor shall also furnish such flagmen as are necessary to give adequate warning to traffic or to the public of any dangerous conditions to be encountered.
- O. No material or equipment shall be stored where it will interfere with the free and safe passage of public traffic, and at the end of each day's work and at other times when construction operations are suspended for any reason, the Contractor shall remove all equipment and other obstructions from that portion of the roadway open for use by traffic.
- P. Temporary facilities, which the Contractor uses to perform the work, shall not be installed or placed where they will interfere with the free and safe passage of public traffic.
- Q. Should the Contractor appear to be neglectful or negligent in furnishing warning devices and taking protective measures as above provided, Owner's Representative or Designer, may direct attention to the existence of a hazard and the necessary warning devices shall be furnished and installed and protective measures taken by the Contractor at his expense. Should Owner's Representative or Designer point out the inadequacy of warning devices and protective measures, such action on the part of Owner's Representative or Designer shall not relieve the Contractor from responsibility for public safety or abrogate his obligation to furnish and pay

for these devices and measures at their cost.

## PART 1 – GENERAL

#### **1.1 RELATED DOCUMENTS**

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

### **1.2 SUMMARY**

- A. General:
  - 1. Temporary controls shall consist of temporary control measures as shown on the plans or as ordered by the Engineer during the life of a contract to control water pollution, soil erosion, and siltation through the use of berms, dikes, dams, sediment basins, fiber mats, gravel, mulches, grasses, slope drains, and other erosion control devices or methods.
  - 2. The temporary erosion control measures shall be coordinated with any permanent erosion control measures specified as part of this contract to the extent practical to assure economical, effective, and continuous erosion control throughout the construction period.
  - 3. Temporary control may include work outside the construction limits such as borrow pit operations, equipment and material storage sites, waste areas, and temporary plant sites.
  - 4. The Contractor shall comply with all clean air laws. He shall get approval of any activities at the construction site that could adversely affect air quality. Such approval shall be obtained from the Missouri Department of Natural Resources, Air Quality Program.
- **B.** Section includes:
  - 1. Furnishing, installing, maintaining (including sediment removal), and removing temporary control measures as shown on the Plans or ordered by the Resident Project Representative. Temporary water pollution and sediment control shall be accomplished through the use of seeding, mulching, straw bales, silt fences, and other erosion control devices or methods, in accordance with these Specifications.
  - 2. The temporary project water pollution control provisions contained herein shall be coordinated with the permanent erosion and sediment control features specified elsewhere in the Specifications to the extent practical to assure effective and continuous erosion control throughout the construction and post construction period.

#### **1.3 UNIT PRICES (Not Applicable)**

#### **1.4 DEFINITIONS (Not Applicable)**

# **1.5 SUBMITTALS**

- A. Submittals are required as specified in Division 1, Section 013300 Submittals; paragraph 3.1.A.
- **B.** Includes, but is not limited to, the following:
  - 1. Manufacturer's installation instruction and certification for the geotextile silt fence stating that the material supplied conforms to the requirements of these specifications. The certification shall include or have attached typical results of tests for the specified properties, representative of the materials supplied.
  - 2. Weight and/or shipping tickets of materials brought on site shall be presented to the Resident Project Representative.

#### 1.6 QUALITY ASSURANCE

- A. Applicable Standards:
  - 1. American Society for Testing and Materials (ASTM).
    - a. ASTM D4632 Tensile Strength.
    - b. ASTM D4355 Ultraviolet Degradation

- c. ASTM D4751 Apparent Opening Size
- d. ASTM D4491 Permittivity.
- **B.** Field Quality Control
  - 1. Prior to installation all materials required under this section shall be subject to the inspection and approval of the Resident Project Representative. During installation, the Resident Project Representative may make surveys and spot checks to ensure that plan lines and grades are met.

## **1.7 PROJECT CONDITIONS**

A. Temporary project water pollution control work generally will involve installation of materials on mine spoil. Surface flow of rainwater may be considerable should precipitation occur during construction.

### PART 2 – PRODUCTS

### 2.1 SEDIMENT CONTROL BALES

- A. Bales shall consist of straw of oats or wheat. Hay may be substituted upon approval by the Owner's Representative.
- **B.** Hardwood posts shall be used. Posts shall have a minimum length of 36 inches and be of sufficient strength to resist damage during installation and to support applied loads.
- C. Bales shall be installed in areas located by the Owner's Representative or Resident Project Representative or as otherwise directed.
- **D.** Bales shall be dug approximately 4" deep with a minimum of eight inches on either side of the gully. Excess soil shall be thrown on the uphill side of the gully.

### 2.2 GEOTEXTILE SILT FENCE

- A. Fibers used in the manufacture of geotextiles shall consist of long chain synthetic polymers, composed of at least 85 percent by weight polyolefin's, polyesters, or polyamides. They shall be formed into a network such that the filaments or yarns retain dimensional stability relative to each other including selvages. The geotextile shall be free of any treatment or coating which might adversely alter its physical properties after installation. Unless otherwise specified, geotextile shall be furnished in 36-inch width (minimum) rolls.
- **B.** Geotextile rolls shall be furnished with suitable wrapping for protection against moisture and extended ultraviolet exposure prior to placement. Each roll shall be labeled or tagged to provide product identification sufficient for inventory and quality control purposes. Rolls shall be stored in a manner that protects them from the elements.
- **C.** Support Fence may be required in areas of high velocities/flows. Wire or other support fence shall be at least 24 inches high and strong enough to support applied loads.
- **D.** Prefabricated Fence. Prefabricated fence systems may be used provided they meet all of the above material requirements.
- **E.** Posts. Hardwood posts shall be used. Posts shall have a minimum length of 36 inches and be of sufficient strength to resist damage during installation and to support applied loads.
- **F.** Geotextile silt fence shall be installed as per manufacturer's instructions in locations as indicated on the plans or as otherwise directed by the Owner's Representative or Resident Project Representative.

e e		Wine Ferrer Summanted	Colf Common to d
Duonoutry	Tost mothed	Wire Fence Supported	<u>Sell Supported</u>
<u>Property</u>	<u>1 est metnoa</u>	Requirements	Requirements
Tensile	ASTM D4632	90 Minimum <sup>2</sup>	90 Minimum <sup>2</sup>
Strength, Lbs.			
Elongation at	ASTM D4632	N/A	50 Maximum
50% Minimum			
tensile strength			
(45 Lbs.)			
Permittivity	ASTM D4491	0.01 *3	0.01 *3
$(Sec^{-1})$			
Apparent	ASTM D4751	0.84 *3	0.84 *3
Opening Size			
(AOS)(mm)			
Ultraviolet			
Degradation at		Minimum 70% Strength	Minimum 70% Strength
500 hours.	ASTM D4355	Retained	Retained

 Table 1: Physical Requirements for Temporary Silt Fence Geotextiles

\*1 All numerical values represent minimum average roll value.

\*2 When tested in any principal direction.

\*3 Permittivity and AOS do not relate directly to the filtration performance of silt fence fabrics. Values presented reflect minimum criteria of products currently used. Performance tests such as VTM-51 or ASTM D5141 may be used to evaluate silt fence performance if deemed necessary by the Owner's Representative.

# 2.3 MULCH

- A. Shall consist of wheat or oat straw.
- **B.** Straw shall be relatively free of prohibited weed seed and all other noxious and undesirable seed as approved by the Owner's Representative. The straw shall not be in an advanced stage of decomposition.

# 2.4 TEMPORARY SEED:

- **A.** Provide fresh, clean temporary <u>new-crop seed</u> complying with rate of application as stated herein. Ship all seed and other materials with certificates of inspection required by governing authorities. Comply with regulations applicable to such materials.
- **B.** All seed must comply with the requirements of the Missouri Seed Law, contain no seed of any plant on the Federal noxious weed list, and contain no seed of any weed not known to exist in Missouri.
- C. Seed, which has become wet, moldy, or otherwise damaged in transit or in storage will not be acceptable and shall be removed from the project site.
- **D.** All leguminous seed shall be inoculated or treated with the proper cultures for the particular legume to be sown.

- 1. The inoculant for treating leguminous seed shall be a pure culture of nitrogen-fixing bacteria. The containers of inoculant shall be plainly marked with the expiration date for use and the manufacturer's directions for inoculating seed.
- 2. The process of inoculation shall be in accordance with the manufacturer's direction for the particular species of legume. The time laps for sowing the seed following inoculations shall not exceed 24 hours.
- 3. A legume shall be inoculated separately with sufficient inoculant to cover all seed before mixing with other seeds. A commercial sticker shall be used to ensure the inoculant adheres to the seed.
- 4. Inoculants shall be applied at double the manufacturer's recommendation.
- **E.** Areas finished outside of the seeding dates may be mulched as per specifications outlined in 015723.3.4 of this section.
- **F.** Acceptable seed mixtures and rates of application are as follows. Seed mixtures are to be applied to those areas as otherwise directed by the Owner's Representative.

Seed Mixture #1

<u>COMMON NAME</u> Pearl Millet	<u>SCIENTIFIC NAME</u> Pennisetum glaucum	VARIETY	Pounds PLS*/ACRE 25
Perennial Ryegrass	Lolium perenne	Manhattan	5
Oats	Avena sativa	Jerry	30
	Seed Mixture #2		
<u>COMMON NAME</u> Wheat	<u>SCIENTIFIC NAME</u> Triticum	VARIETY	Pounds PLS*/ACRE
Perennial Ryegrass	Lolium perenne	Manhattan	5
Annual Ryegrass	Lolium multiflorum		5

Seed Mixture #2 shall be planted in all areas if seeded between October 01 and February 29.

\* Pounds PLS/Acre is seeding application rate in terms of pounds Pure Live Seed (PLS) per acre.

# 2.5 FERTILIZER:

A. Fertilizer shall be a standard commercial product, which when applied at the proper rate, will supply the quantity of total actual nitrogen (N), total phosphorus (P), and soluble potassium (K), required under Part 3 paragraph 3.7.G of this Section.

# PART 3 – EXECUTION

#### 3.1 SCHEDULE

A. Prior to the start of construction, the Contractor shall be required to submit schedules/drawings for the accomplishment of temporary and permanent erosion and pollution control work within the Project limits; as applicable for clearing and grubbing; grading; construction; paving; and structures at watercourses in accordance with the requirements of this section and Appendices 1 and 2 of the Specifications; as shown in Plan details; and as directed by the Owner's Representative or Resident Project Representative. The Contractor shall also submit a proposed method of erosion and dust control on haul roads and borrow pits and a plan for disposal of waste materials. Work shall not be started until the erosion control schedules and methods of operation for the applicable construction have been accepted by the Project Engineer.

# **3.2 AUTHORITY OF THE PROJECT ENGINEER**

A. The Project Engineer has the authority to limit the surface area of erodible earth material exposed by

clearing and grubbing, to limit the surface area of erodible earth material exposed by excavation, borrow and fill operations, and to direct the Contractor to provide immediate permanent or temporary pollution control measures to minimize contamination of adjacent streams or other watercourses, lakes, ponds, or other areas of water impoundment.

- **B.** The Project Engineer and/or Owner's Representative shall be responsible for verifying the Contractor's compliance to the extent that construction practices, construction operations, and construction work are involved.
- **C.** In the event of conflict between these requirements and pollution control laws, rules, or regulations of other Federal, State, or local agencies, the more restrictive laws, rules, or regulations shall apply.

## **3.3 GENERAL REQUIREMENTS**

- **A.** The Contractor will be required to incorporate all permanent erosion and sediment control features into the project. Temporary pollution control measures shall be used to correct conditions that develop during construction; that are needed prior to installation of permanent pollution control features; or that are needed temporarily to control erosion that results from normal construction practices.
- **B.** Where erosion and sedimentation is likely to be a problem, the Owner's Representative may require the Contractor to schedule and perform clearing and grubbing such that grading and storm drainage systems are completed immediately following clearing and grubbing, if conditions permit. Temporary erosion and sediment control measures may be required between successive construction stages.
- **C.** The Project Engineer and/or Owner's Representative may limit the surface area of erodible earth material exposed by clearing and grubbing, surface area erodible earth material exposed by excavation, borrow, and fill operations. The Contractor may be directed to provide immediate temporary or permanent pollution control measures to prevent contamination of adjacent streams or other watercourses, lakes, ponds, or areas of water impoundment. Such work may involve construction of geotextile or bale silt fence, use of temporary mulches, seeding, or other control devices or methods, as necessary to control erosion. If sediment control features are not maintained, then the work may be shut down until corrective actions are performed by the Contractor at no additional compensation, at the direction of the Owner's Representative. A 24-hour written notice will be given prior to shut down.
- **D.** Pollutants such as fuels, lubricants, bitumen, concrete, wash-water from concrete mixing operations, raw sewage, trash, and other harmful materials shall not be allowed to enter rivers, streams, and other natural or man-made channels/impoundments leading thereto.
- **E.** Unless otherwise provided or approved in writing by the Owner's Representative, construction operations in rivers, streams, and impoundments shall be restricted to those areas which must be entered for the construction of temporary or permanent structures. Rivers, streams, and impoundments shall be promptly cleared of all falsework, piling, debris, or other obstructions placed therein or caused by the construction operations.
  - 1. Whenever construction equipment must cross watercourses at frequent intervals, and such crossings will adversely affect the sediments levels, then temporary structures should be provided.
- **F.** Fording of live streams with construction equipment will not be permitted unless specifically approved by the Owner's Representative. Temporary bridges or other structures shall be used wherever an appreciable number of stream crossings are necessary. Unless otherwise approved in writing by the Owner's Representative, mechanized equipment shall not be operated in live streams except as may be required to construct channel changes and temporary or permanent structures. If a Section 404 permit is applicable for this project, its requirements and/or conditions shall prevail.
- **G.** In the event that temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as part of the work as scheduled and/or ordered by the Project Engineer of Construction Representative, such work shall be performed by the Contractor at his/her own expense without additional compensation.

- **H.** The Owner's Representative has obtained a NPDES permit for this Project which is included as Appendix 1. The Contractor will be required to operate within all permit restrictions. In the event that any fines are assessed to the Owner's Representative resulting from the Contractor's violation of permit restrictions, the amounts payable to the Contractor under this Project will be reduced by the amount of such fines.
  - 1. If, at any time, the Contractor is found to be in violation of the permit restrictions and requirements, he will be allowed 48 hours to make corrective actions to bring the work back into conformance with the permit restrictions and requirements. The 48 hour time period will commence to run at that date and time at which the Contractor or his superintendent at the project site is first notified of the violation.
    - a. If adequate corrective actions are not taken within 48 hours after violation notification, the Contractor will be directed to cease all other operations until the necessary corrective actions have been taken, and a notice to recommence the work is issued.
    - b. No Contract Time Extensions or compensation payment will be made to the Contractor as a result of violation of the permit restrictions and/or compliance requirements.
  - 2. The Contractor shall implement and meet all applicable requirements of the NPDES permit.
  - 3. The Resident Project Representative will monitor water quality and sample, if required, in accordance with applicable permits.
  - 4. The Owner's Representative will bear the costs of all laboratory testing associated with monitoring.
  - 5. The Contractor will bear the cost of all laboratory testing associated with the discharge resulting from dewatering activities if required.
  - 6. The Contractor will be responsible for the repair and cost of all damages resulting from sedimentation.

### 3.4 STRAW BALE INSTALLATION

- A. Straw bales shall be installed in accordance with the Plans and Specifications.
- **B.** Straw bales may be used at the bottom of slopes and on the lower side of cleared areas to divert water and retain sediment.
- C. Straw bales may be used as ditch checks and to correct rill and gully erosion in small ditches and drainage areas.
- **D.** The Contractor shall maintain the integrity of the straw bales as long as they are necessary to control sediment. The Resident Project Representative and Contractor shall inspect all straw bales immediately after each rainfall and at least daily during prolonged rainfall. Any deficiencies shall be immediately corrected by the Contractor. In addition, the Contractor shall make a daily review of the location of the straw bales in areas where construction activities have changed the natural contour and drainage runoff to ensure that the straw bales are properly located for effectiveness. Where deficiencies exist, additional straw bales shall be installed as approved or directed by the Resident Project Representative.
- **E.** The Contractor shall remove and dispose of sediment deposits when the deposit approached one-half (1/2) the height of the bales or sooner when directed by the Resident Project Representative. If required by heavy sediment loading, more lines of straw bales shall be installed as directed by the Resident Project Representative.
- **F.** The straw bales shall remain in place until the Owner's Representative directs removal. The Contractor shall remove and dispose of any excess silt accumulations, grade and dress the area to the satisfaction of the Owner's Representative, and establish vegetation on all bare areas in accordance with the requirements of the applicable Specifications.

### 3.5 SILT FENCE INSTALLATION

**A.** Installation of wire supported and/or self-supporting geotextile fence may be required in areas of high velocities or flows, as directed by the Resident Project Representative.

- **B.** Silt fence may be used at the bottom of slopes and on the lower side of cleared areas to divert water and retain sediment.
- C. Silt fence may be used as ditch checks and to correct rill and gully erosion in small ditches and drainage areas.
- **D.** Post spacing shall not exceed eight (8) feet for wire support fence installations or five (5) feet for self-supported installations. Posts shall be driven a minimum of 24 inches into the ground. Where rock is encountered posts shall be installed in a manner approved by the Owner's Representative. Closer spacing, greater embedment depth and/or wider posts shall be used as necessary in low areas and soft or swampy ground to ensure adequate resistance to applied loads.
- **E.** When support fence is used, the mesh shall be fastened securely to the up-slope side of the post. The mesh shall extend into the trench a minimum of two inches and extend a maximum of 36 inches above the original ground surface.
- F. When self-supported fence is used, the geotextile shall be securely fastened to fence posts.
- **G.** The Contractor shall maintain the integrity of silt fences as long as they are necessary to contain sediment runoff. The Resident Project Representative and the Contractor shall inspect all temporary silt fences immediately after each rainfall and at least daily during prolonged rainfall. Any deficiencies shall be immediately corrected by the Contractor. In addition, the Contractor shall make a daily review of the location of silt fences in areas where construction activities have changed the natural contour and drainage runoff to ensure that the silt fences are properly located for effectiveness. Where deficiencies exist, additional silt fences shall be installed as approved or directed by the Resident Project Representative.
- **H.** The Contractor shall remove and dispose of sediment deposits when the deposit approaches one-half the height of the fence or sooner when directed by the Resident Project Representative. If required by heavy sediment loading, more silt fence shall be installed as directed by the Resident Project Representative.
- I. Silt fence shall remain in place until the Owner's Representative directs removal. Upon silt fence removal, the Contractor shall dispose of any excess silt accumulations, grade and dress the area to the satisfaction of the Owner's Representative, and establish vegetation on all bare areas in accordance with the requirements of the applicable Specifications and at no additional expense to the Owner.

# 3.6 TEMPORARY MULCH

- A. At the discretion of the Owner's Representative, for the purpose of temporary erosion control prior to seeding, temporary mulch may be required on all or parts of the project site. Mulch shall be composed of straw of oats or wheat for temporary water pollution control.
  - 1. At the request of the Owner's Representative; the Contractor, Resident Project Representative, and Owner's Representative shall meet on-site to determine what area(s) of the project site should be mulched and their associated acreage.
  - 2. Mulch shall be spread uniformly to form a continuous loose blanket not less than one and one-half (1 <sup>1</sup>/<sub>2</sub>) inches or more than two (2) inches.
  - 3. Bunching or matting of mulch shall be avoided and corrected by hand methods, if so directed by the Owner's Representative.
  - 4. Straw mulch shall be crimped into the soil by means of straw crimper equipment manufactured specially for such purpose.
  - 5. The Contractor shall promptly complete the mulch application within fifteen (15) days of written notice to proceed from the Owner's Representative.
  - 6. If mulch is required on the project site totaling less than one (1) acre, the Contractor will be reimbursed for not less than one (1) acre. The one (1) acre may or may not be contiguous.

#### 3.7 TEMPORARY SEEDING

- **A.** At the discretion of the Owner's Representative, for the purpose of temporary erosion control prior to permanent seeding, temporary seed may be required on all or parts of the project site.
- **B.** At the request of the Owner's Representative, the Contractor and Resident Project Representative shall meet on site to determine what area(s) of the project site should be temporary seeded and their associated acreage, and records shall be agreed-upon and kept for project billing purposes.
- C. Seed Mixture 1 or 2 shall be applied at the rates as described in Section 015723, paragraph 2.4.F.
- **D.** Drill the seed following site contours using a mechanical power drawn seed drill that places the seed at least 1/4", but no more than 1/2" deep into the soil, or at depths directed by the Owner's Representative. Drill seeding shall be accomplished with drills using a drill-tube spacing of between 7" and 9". If inspection during, or after, seeding operations reveals there is a show of green and/or indicates that areas have been left unplanted, then additional seed of the appropriate species/quantity shall be sown as directed by the Owner's Representative at no additional cost to the Owner.
  - 1. Hand broadcasting may be allowed in areas not accessible to drills or other equipment, upon request. Once applied, hand-broadcasted seed areas must be covered by at least <sup>1</sup>/<sub>4</sub>" but no more than <sup>1</sup>/<sub>2</sub>" soil, by means of hand rakes or other approved methods. Seeding rates in hand-broadcasted areas shall be double those listed in Section 015723, paragraph 2.4.F.
- **E.** The Contractor shall promptly complete the temporary seeding within fifteen (15) days of written notice to proceed from the Owner's Representative.
- **F.** If temporary seed is required on project sites totaling less than one (1) acre, the Contractor will be reimbursed for not less than one (1) acre. The one (1) acre may or may not be contiguous.
- **G.** Lime and/or fertilizer will be required as directed by the Owner's Representative. Rates will be provided by the Owner's Representative. Application of lime and fertilizer shall be in accordance with the requirements already set forth in Section 312000.3.5 and Section 329219.2.3, respectively.
- **H.** The seedhead of the temporary crop shall not be allowed to mature. The Contractor shall mow the temporary crop to prevent seedhead maturity. Should wet conditions not allow the Contractor to mow the crop and the seedhead matures, the Contractor shall combine the crop to prevent a volunteer cereal crop.
- I. Permanent grass species shall not be drilled directly into the temporary grass seeded areas. Prior to permanent grass seed planting, the temporary grass seeded areas shall first be worked/incorporated to a depth of six (6) inches by discing, harrowing, or other approved methods.

# **SECTION 017113 - OVERALL SITE PREPARATION**

### PART 1 - GENERAL

### 1.1 **DESCRIPTION**

A This work shall consist of furnishing all labor, materials, and equipment necessary to complete construction in accordance with the plans and as herein specified.

### PART 2 – PRODUCTS (NOT USED)

#### **PART 3 - EXECUTION**

- A. <u>Drainage</u> All grading shall be done to leave a uniform surface with no ponding and channeling of surface water. Grading shall provide for positive drainage away from all proposed improvements.
- B. <u>Erosion Control</u> The Contractor shall incorporate all permanent erosion control measures, such as specified in Permanent Erosion Control and Landscaping, as soon as practical. Temporary control measures, such as temporary mulching, will be used when it is not practical to incorporate permanent erosion control measures at that time. Temporary control measures may be required between successive construction stages.
- C. <u>Soil Compaction</u> All soil compaction shall be a minimum of 95% of the Standard Proctor for the material placed.
- D. <u>Landscaping</u> Damage to existing landscaping will be corrected to the satisfaction of Darren Krehbiel Consultants, LLC, at the expense of the Contractor.
- E. Any miscellaneous structures that are to be removed shall be demolished and removed, and all materials such as waste, dirt, debris, or unsuitable or excess topsoil and subsoil resulting from the work shall be disposed of legally off the project site. The remaining or existing foundations, or other underground structures shall be destroyed and objectionable material which cannot be used in backfill shall be disposed of off the project site or as designated by the Owner.

# **SECTION 017400 – CLEANING**

#### PART 1 - GENERAL

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

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

#### **PART 2 - PRODUCTS**

#### 2.1 MATERIALS

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

#### **PART 3 - EXECUTION**

#### **3.1 PROGRESS CLEANING**

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

- 3. Maintain the site in a neat and orderly condition at all times.
- C. Structures
  - 1. Daily, inspect the structures and pick up all scrap, debris, and waste material. Remove all such items to the place designated for their storage.
  - 2. Weekly, sweep all interior spaces clean. "Clean" for the purposes of this paragraph, shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and handheld broom.
  - 3. In preparation for installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using all equipment and materials required to achieve the required cleanliness.
  - 4. Following the installation of finish floor materials, clean the finish floor daily while work is being performed in the space in which finish materials have been installed. "Clean" for the purposes of this subparagraph, shall be interpreted as meaning free from all foreign material which, in the opinion of the Construction Representative, may be injurious to the finish of the finish floor material.

# **3.2** FINAL CLEANING

- A. General: Provide final cleaning operations when indicated. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of Work to the condition expected from a commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
- B. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for the entire Project or a portion of the Project.
  - 1. Clean the Project Site, yard and grounds, in areas disturbed by construction activities including landscape development areas, of rubbish, waste material, litter, and foreign substances.
  - 2. Sweep paved areas broom clean. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
  - 3. Remove petrochemical spills, stains, and other foreign deposits.
  - 4. Remove tools, construction equipment, machinery, and surplus material from the site.
  - 5. Remove snow and ice to provide safe access to the building.
  - 6. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
  - 7. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
  - 8. Broom clean concrete floors in unoccupied spaces.
  - 9. Vacuum clean carpet and similar soft surfaces removing debris and excess nap. Shampoo, if required.
  - 10. Clean transparent material, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-

obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.

- 11. Remove labels that are not permanent labels.
- 12. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
  - a. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
- 13. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- 14. Clean plumbing fixtures to a sanitary condition free of stains, including stains resulting from water exposure.
- 15. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
- 16. Clean ducts, blowers, and coils if units were operated without filters during construction
- 17. Clean food-service equipment to a sanitary condition, ready and acceptable for its intended use.
- 18. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs and defective and noisy starters in fluorescent and mercury vapor fixtures.
- 19. Leave the Project clean and ready for occupancy.
- C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid the Project of rodents, insects, and other pests. Comply with regulations of local authorities.
- D. Removal of Protection: Remove temporary protection and facilities installed during construction to protect previously completed installations during the remainder of the construction period.
- E. Compliances: Comply with governing regulations and safety standards for cleaning operations. Remove waste materials from the site and dispose of lawfully.
  - 1. Where extra materials of value remain after Final Acceptance by the Owner, they become the Owner's property.

### SECTION 020000 - ABBREVIATIONS FOR CODES AND STANDARDS ORGANIZATIONS

#### ABBREVIATION CODES AND STANDARDS ORGANIZATIONS

AASHTO	American Association of State Highway & Transportation Officials
ACI	American Concrete Institute
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASTM	American Standards and Testing Methods
AWWA	American Water Works Association
NEC	National Electrical Code
NEMA	National Electric Manufacturers Association
NFPA	National Fire Protection Association
NSF	National Sanitation Foundation
UL	Underwriters Laboratories

## **SECTION 022300 – SITE CLEARING**

### PART 1 - GENERAL

#### 1.1 SUMMARY – THIS SECTION INCLUDES THE FOLLOWING:

- A. Protecting existing trees and vegetation to remain.
- B. Removing trees and other vegetation.
- C. Clearing and grubbing.
- D. Topsoil stripping.

#### **1.2 REFERENCED SECTIONS INCLUDE THE FOLLOWING:**

A. Section 015723 "Temporary Erosion, Siltation, and Storm Water Pollution Control".

#### **1.3 REFERENCED STANDARDS INCLUDE THE FOLLOWING:**

A. No Standards referenced in this Section.

#### **1.4 DEFINITIONS**

A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of weeds, roots, and other deleterious materials.

#### 1.5 MATERIALS OWNERSHIP

A. Except for materials indicated to be stockpiled or to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from the site.

## **1.6 PROJECT CONDITIONS**

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
  - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
  - 2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- B. Improvements on Adjoining Property: Authority for performing indicated removal and alteration work on property adjoining Owner's property will be obtained by Owner before award of Contract.
- C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.
- D. Notify utility locator service for area where Project is located before site clearing.

## PART 2 - PRODUCTS (NOT APPLICABLE)

# PART 3 - EXECUTION

#### **3.1 PREPARATION**

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Provide erosion-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Locate and clearly flag trees and vegetation to remain or to be relocated.
- D. Protect existing site improvements to remain from damage during construction.
  - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

### **3.2 TREE PROTECTION**

- A. Erect and maintain a temporary fence around drip line of individual trees or around perimeter drip line of groups of trees to remain. Remove fence when construction is complete.
  - 1. Do not store construction materials, debris, or excavated material within drip line of remaining trees.
  - 2. Do not permit vehicles, equipment, or foot traffic within drip line of remaining trees.
- B. Do not excavate within drip line of trees, unless otherwise indicated.
- C. Where excavation for new construction is required within drip line of trees, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.
  - 1. Cover exposed roots with burlap and water regularly.
  - 2. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.
  - 3. Coat cut faces of roots more than 1-1/2 inches in diameter with emulsified asphalt or other approved coating formulated for use on damaged plant tissues.
  - 4. Cover exposed roots with wet burlap to prevent roots from drying out. Backfill with soil as soon as possible.
- D. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Engineer.
  - 1. Employ a qualified arborist, licensed in jurisdiction where Project is located, to submit details of proposed repairs and to repair damage to trees and shrubs.
  - 2. Replace trees that cannot be repaired and restored to full-growth status, as determined by the qualified arborist.

## **3.3 CLEARING AND GRUBBING**

- A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction. Removal includes digging out stumps and obstructions and grubbing roots.
  - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
- 2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
- 3. Completely remove stumps, roots, obstructions, and debris extending to a depth of 18 inches below exposed subgrade.
- 4. Use only hand methods for grubbing within drip line of remaining trees.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.
  - 1. Place fill material in horizontal layers not exceeding 8-inch loose depth, and compact each layer to a density equal to adjacent original ground.

# 3.4 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.
  - 1. Strip surface soil of unsuitable topsoil, including trash, debris, weeds, roots, and other waste materials.
- C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  - 1. Limit height of topsoil stockpiles to 72 inches.
  - 2. Do not stockpile topsoil within drip line of remaining trees.
  - 3. Stockpile surplus topsoil and allow for respreading deeper topsoil.

# 3.5 DISPOSAL

A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off Owner's property.

# END OF SECTION 022300

# SECTION 023100 – EXCAVATING & BACKFILLING TRENCHES

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Trenching for piped and buried utilities.
  - 2. Backfilling of trenches.
- B. Related Sections include the following:
  - 1. Section 015723 "Temporary Erosion, Siltation, and Storm Water Pollution Control".
  - 2. Section 022300 "Site Clearing".
- C. Referenced Standards include the following:
  - 1. ASTM D 422 Standard Test Methods for Particle-Size Analysis of Soils; 2002.
  - ASTM D 698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)); American Society for Testing and Materials; 2000a.
  - ASTM D 1556 Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method; American Society for Testing and Materials; 2000.
  - 4. ASTM D 1586 Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils; American Society for Testing and Materials; 1999.
  - ASTM D 2167 Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; American Society for Testing and Materials; 1994.
  - 6. ASTM D 2321 Standard Practice for Underground Installation of Thermoplastic Pipe of Sewers and Other Gravity-Flow Applications; 2000.
  - ASTM D 2487 Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System); American Society for Testing and Materials; 2000.

- ASTM D 2922 Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth); American Society for Testing and Materials; 2001.
- 9. ASTM D 2937 Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method; American Society for Testing and Materials; 2000.
- ASTM D 3740 Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; American Society for Testing and Materials; 2001.
- ASTM E 329 Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction; American Society for Testing and Materials; 2000b.
- 12. ASTM E 548 Standard Guide for General Criteria Used for Evaluating Laboratory Competence; American Society for Testing and Materials; 1994e1.
- 13. NFPA 495 Explosive Materials Code; National Fire Protection Association; 2001.
- 14. Missouri Standard Specifications for Highway Construction, 1999

# 1.2 UNIT PRICES (NOT USED)

## **1.3 DEFINITIONS**

- A. Bedding: Material placed from the excavated subgrade material to the flow line of the pipe.
- B. Haunching: Material placed from the flow line of the pipe to the spring line of the pipe.
- C. Embedment: Includes bedding, haunching, and initial backfill.
- D. Backfill: Material used to fill the excavation of a trench.
  - 1. Initial Backfill: Material placed from the spring line of the pipe to a minimum of 12 inches above the top of the pipe or as shown on the Plans.
  - 2. Final Backfill: Material placed from the top of initial backfill to the top of the trench or to the bottom of an improved surface.
- E. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.
- F. Improved Surface: Any existing or proposed surface including roads, parking lots, curbs, slabs, sidewalks or other manmade surface courses designated to receive vehicular or pedestrian traffic or other loading; does not include lawns or landscaped areas, which are not designed or designated to receive traffic loading.

G. NPS: Nominal Pipe Size.

H. Spring Line: The elevation equal to the horizontal centerline of a pipe.

I. Subgrade: 1. Surface or elevation at the bottom of an excavation. 2. The top surface of backfill immediately below pavement base, subbase, drainage fill, or topsoil materials.

J. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material exceeding 1 cu. yd. for bulk excavation or 3/4 cu. yd. for trench and pit excavation that cannot be removed by excavating equipment without systematic drilling, ram hammering, ripping, sawing or blasting, when permitted.

# 1.4 SUBMITTALS

Material Test Reports: Submit from a qualified testing agency indicating and interpreting test results for compliance with Section 3.18 and the following:

- 1. Soil Classifications.
- 2. Gradation Tests.
- 3. Moisture-Density Relations (Proctor).
- 4. In-Place Field Density Tests.

B. Flowable Backfill Mix Design: Include mix proportions by weight and laboratory trial mix results or field test data.

1. Indicate amounts of mix water to be withheld for later addition at Project site.

# 1.5 QUALITY ASSURANCE

- A. Comply with applicable requirements of NFPA 495, "Explosive Materials Code" or local requirements, whichever is more restrictive.
- B. Seismic Survey Agency: An independent testing agency, acceptable to authorities having jurisdiction, experienced in seismic surveys and blasting procedures shall perform the following services:
  - Report types of explosive and sizes of charge to be used in each area of rock removal, types of blasting mats, sequence of blasting operations, and procedures that will prevent damage to site improvements and structures on Project site and adjacent or nearby properties.
  - 2. Seismographic monitoring services during blasting operations.
- C. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to

EXCAVATING & BACKFILLING TRENCHES PROJECT NO. X1807-01

ASTM E 329 to conduct soil materials and rock-definition testing, according to ASTM D 3740 and ASTM E 548.

# 1.6 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Engineer and then only after arranging to provide temporary utility services according to requirements indicated:
  - 1. Notify Engineer not less than two days in advance of proposed utility interruptions.
  - 2. Do not proceed with utility interruptions without 24 hours notice to property owner and Engineer's permission.
  - 3. Contact utility-locator service for area where Project is located before excavating.

## PART 2 - PRODUCTS

### 2.1 SOIL MATERIALS

- A. General: Provide borrow materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: Shall be free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, organic materials, and other deleterious matter and as specified below:
  - Embedment: ASTM D 2487 soil classification groups GW, GP, SW, SP and with fines content (% passing No. 200 sieve) not to exceed 5%.
  - Final Backfill: ASTM D 2487 soil classification groups CL, ML-CL, GC, SC, ML, MH, GW, GP, GM, SM, SP and SM, a combination of these group symbols, as limited elsewhere in these specifications.
- C. Unsatisfactory Soils:
  - Embedment: ASTM D 2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT.
  - 2. Final Backfill: ASTM D 2487 soil classification groups CH, OL, OH, and PT.
  - 3. Unsatisfactory soils include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

Granular Embedment Material: Embedment material shall conform to Class IA, IB, or II as specified in ASTM D 2321 and as follows:

4.Class IA materials shall conform to the following gradation requirements:EXCAVATING & BACKFILLING TRENCHESPROJECT NO. X1807-01023100 - 4

Sieve	% Passing
1 1⁄2"	100
3/4"	65-100
1/2"	47-77
3/8"	33-57
#4	0-10
#200	0-5

- a. Pre-approved Class IA materials include the following:
  - 1) No pre-approved materials
- 5. Class IB materials shall conform to the following gradation requirements:

Sieve	% Passing
1 1⁄2"	100
3/4"	65-100
1/2"	47-80
3/8"	33-71
#4	0-50
#200	0-5

- a. Pre-approved Class IB materials include the following:
  - 1) Grade 5 Aggregate for Drainage, as specified in Missouri Standard Specifications for Highway Construction (1999) Section 1009.

Sieve	% Passing
1 1/2"	100
3/4"	65-100
1/2"	47-100
3/8"	33-100
#4	0-100
#200	0-5

6. Class II materials shall conform to the following gradation requirements:

- a. Pre-approved Class II materials include the following:
  - 1) Type 4 Aggregate for Base, as specified in Missouri Standard Specifications for Highway Construction (1999) Section 1007.
  - 2) Type 1 Aggregate for Base and Type 5 Aggregate for Base, as specified in Missouri Standard Specifications for Highway Construction (1999) Section 1007, may be used PROVIDED that the production of the product is controlled to provide a Maximum of 5% by weight of material passing a No. 200 sieve.
- 7. Use of a material not pre-approved may be acceptable only after obtaining written approval from the Engineer prior to use. The following is the minimum required information to be submitted to the Engineer for approval:
  - a. Name, address and phone number of Supplier
  - b. Name of material (include respective ASTM class designation)
  - c. Grain Size Analysis Tests, according to ASTM C 136.
  - d. Representative samples of the material(s) (1 cubic foot minimum)

# 2.2 CONCRETE

- A. Concrete: ASTM C 94, and the following:
  - 1. Cement: ASTM C 150, Type I/II,

2. Fine Aggregate: ASTM C33, sand. EXCAVATING & BACKFILLING TRENCHES PROJECT NO. X1807-01

- 3. Coarse Aggregate: ASTM C33, #57 or 67
- 4. Water: Potable.
- 5. Air entrainment: ASTM C260.
- B. Flowable Backfill Portland Cement Mix Design: 40-psi minimum and 80 psi maximum compressive strength.
  - 1. Air entrainment admixtures may be used as approved by the Engineer.
- C. Concrete Fill or Encasement Portland Cement Mix Design: 3000-psi minimum compressive strength.
  - 1. Air entrainment admixtures may be used as approved by the Engineer.

## 2.3 ACCESSORIES

- A. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, minimum 6 inches wide and 4 mils thick, continuously inscribed with a description of utility, with metalic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:
  - 1. Red: Electric.
  - 2. Yellow: Gas, oil, steam, and dangerous materials.
  - 3. Orange: Telephone and other communications.
  - 4. Blue: Potable Water systems.
  - 5. Green: Sanitary Sewer systems.
- B. Locator Wire: No. 12 vinyl-coated copper wire placed on top of pipe and inserted into valve boxes.

## 2.4 STEEL CASING

A. Steel casing shall be new welded steel pipe with minimum yield strength of 35,000 psi. The minimum wall thickness of steel casing shall be as shown on the following table:

	Steel Casing Pipe			
Carrier Pipe Casing Pipe Nominal I.D. (in) Nominal I.D. (in)		Wall Thickness (in)		
4	10	0.188		

# PART 3 - 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 earthwork operations.
- B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.
- C. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

### 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.
  - 2. Install a dewatering system to lower and maintain water level below pipe flowline and to convey ground water away from excavation work areas. Maintain until dewatering is no longer required.

## 3.3 EXCAVATION FOR UTILITY TRENCHES

- A. Unclassified Excavation: Excavation to subgrade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions shall be unclassified excavation.
  - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil or granular materials.
- B. The Contractor shall not open more trench in advance of pipe laying than is necessary to expedite the work. Four hundred (400) feet shall be the maximum length of open trench on any line under construction.
- C. Excavate trenches to indicated grades, alignments, depths, and elevations.
  - 1. Minimum depth of trench excavation shall be such that there is three feet of fill above the top of pipe.
- D. Use of mechanical equipment will not be permitted in locations where its operation would cause damage to trees, buildings, culverts or other existing property, utilities or structures above or below ground. In all such locations, hand excavation methods shall be used.

# 3.4 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavations under other construction or utility pipe as directed by Engineer.

### 3.5 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow materials and satisfactory excavated soil materials. Stockpile 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.

# **3.6 TRENCH WIDTH**

- A. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit.
- B. Excavate trench walls vertically from trench bottom to 6 inches higher than top of pipe or conduit, unless otherwise indicated.
- C. The minimum trench width shall be as follows where trench walls are stable:

EXCAVATING & BACKFILLING TRENCHES PROJECT NO. X1807-01

- 1. NPS up to 24 inches: outside diameter of pipe plus 16 inches, but not less than 18 inches.
- 2. NPS greater than 24 inches: outside diameter of pipe plus 24 inches.
- 3. Where trench walls must be supported, increase the trench width sufficiently to allow the same amount of clearance as required above.
- D. Where unstable native soil conditions exist, the minimum trench width shall be as follows:
  - 1. NPS up to 10 inches: three times the pipe diameter.
  - 2. NPS greater than 10 inches: three times the pipe diameter, or the pipe diameter plus four feet, whichever is greater.

# 3.7 FOUNDATIONS

A. If Engineer determines that unsatisfactory soil is present and that foundations are required, continue excavation and replace with timber, concrete or other material as directed by the Engineer. Additional excavation and replacement material such as timber, concrete, or other foundation will be paid for according to Contract provisions for changes in the Work.

### **3.8 GROUNDWATER BARRIERS**

- A. Where native soils consist of low permeable soils such as clays or bedrock, construct groundwater barriers to minimize the flow of groundwater though the finished trench. Native soils consisting of high permeable soils such as sands may not require groundwater barriers if approved in writing from the Engineer.
- B. Groundwater barriers shall be constructed as follows:
  - 1. Materials: Groundwater Barrier Materials meet soil classification GC, SC, CL, OR ML-CL.

Material may be finely divided suitable job excavated material, free from stones, organic matter and debris.

2. Frequency: Construct Groundwater Barriers at a minimum of 1,000-foot intervals. Where

1,000-foot interval falls within an improved surface, construct groundwater barrier to less than the 1,000-foot interval outside of the improved surface.

3. Depth: Groundwater barriers shall be compacted the full depth of granular embedment

material from the subgrade or foundation to an elevation one foot above the top of the granular embedment material, but not less than four (4) feet.

- 4. Width: shall extend the full width of the trench.
- 5. Thickness: shall be a minimum of four (4) feet thick measured along the length of the pipe.

## 3.9 TRENCH BOTTOMS AND BEDDING

A. Pressure piping: Excavate and shape trench bottoms to provide uniform bearing and support of pipes

and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

- 1. For pipes and conduit less than 6 inches in nominal diameter hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
- For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe circumference. Fill depressions with tamped sand backfill.
- 3. Where rock or other unyielding bearing material exists at the trench bottom, over excavate a depth equal to one forth the outside pipe diameter but not less than 6 inches deeper than elevation required to allow for bedding course. Place and compact bedding material on trench bottom and where indicated. Shape bedding material to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
  - a. Bedding Material: Granular Embedment Material.
- B. Gravity piping: Excavate trench bottom to a depth equal to one forth the outside pipe diameter, but not less than 6 inches below the required flow line elevation to allow for bedding.
  Place and compact bedding on trench bottom. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
  - 1. Bedding Material: Granular Embedment Material.
  - 2. If compaction of the bedding material can not be obtained due to natural unyielding or poor

subgrade material, a foundation course may be required. Cease work and notify Engineer immediately to inspect the subgrade and recommend further action.

### 3.10 HAUNCHING

023100 - 11

A. Carefully compact, as required, haunching material under pipe, bring up evenly on both sides of the

pipe and along the full length of pipe to the spring line of the pipe to avoid damage or displacement of piping.

- B. Pressure piping: use the following materials:
  - 1. When bedding is not required; compacted satisfactory soil embedment material.
  - 2. When bedding is required; Granular Embedment Material, compacted as required.
- C. Gravity piping haunching material shall be as follows:
  - 1. Granular Embedment Material, compacted as required.

# 3.11 BACKFILL GENERAL

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

- 1. Survey placed or constructed underground utilities as required for record documents.
- 2. Remove trash and debris.
- 3. Remove temporary shoring and bracing, and sheeting.
- 4. Where compacted backfill is required, place the material in horizontal layers less than eight

(8) inches in depth of loose measure.

- 5. Moisture content shall be such that the required degree of compaction can be obtained.
- 6. Compact each layer by hand, machine tampers, or by other suitable equipment to the required compaction.

B. Fill voids with approved initial backfill materials while shoring and bracing, and as sheeting is removed.

C. Install warning tape directly above utilities as specified elsewhere in these specifications, 12 inches below finished grade and 6 inches below improved surfaces.

# 3.12 INITIAL BACKFILL

A. Initial backfill shall be carefully placed and compacted as required to 12 inches above the top of the pipe to prevent damage to the pipe.

EXCAVATING & BACKFILLING TRENCHES PROJECT NO. X1807-01 023100 - 12

B. Unimproved surfaces: Use the following materials for initial backfill under unimproved surfaces:

- 1. Pressure piping: Satisfactory Soil Embedment Material, compacted as required.
- 2. Gravity piping: Granular Embedment Material, compacted as required.

C. Improved surfaces: Use the one of the following materials for initial backfill under improved surfaces:

- 1. Granular Embedment Material, compacted as required.
- 2. Flowable backfill.

## 3.13 FINAL BACKFILL

- A. Unimproved surfaces: Use satisfactory soil backfill.
- B. Improved surfaces: Use the one of the following materials for initial backfill under improved surfaces:
  - 1. Granular embedment material, compacted.
  - 2. Flowable backfill.

## 3.14 COMPACTION REQUIREMENTS

- A. Bedding and Haunching: Compact embedment materials for bedding and haunching to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
  - 1. Satisfactory soil embedment material: 90%.
  - 2. Granular embedment material: 90%.
- B. Backfill under unimproved surfaces: Compact embedment and backfill materials for initial and final backfill to be placed under unimproved surfaces to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
  - 1. Initial backfill:
    - a. Satisfactory soil embedment material: 85%.
    - b. Granular embedment material: 85%.
  - c. Compaction of initial backfill under unimproved surfaces may be waived by the Engineer for part or the entire project. Compaction shall be required unless written approval has been obtained from the Engineer.

- 2. Final backfill: adequate compactive effort shall be applied to satisfactory soil material to ensure no substantial settlement of the final backfill.
- C. Backfill under improved surfaces: Compact embedment and backfill materials for initial and final backfill to be placed under improved or proposed improved surfaces to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
  - 1. Granular Embedment Material: 95%.
- D. Groundwater Barriers: Compact groundwater barrier materials under unimproved surfaces to not less than the following Percentages of maximum dry unit weight according to ASTM D 698:
  - 1. Groundwater Barrier Material: 90%.
- E. Class IA Granular Embedment Material shall not require compaction.
- F. Waiving of Compaction Testing Requirements: Class IB Granular Embedment Material compaction testing may be waived if gradation analyses reveals that the material is sufficiently open graded and that compactive efforts by either mechanical or hand compaction operations do not produce an effective increase in percent compaction. Materials proposed to be waived for compaction testing shall be approved by the Engineer prior to use on this project. The following materials have been pre-approved and do not require compaction testing:
  - 1. No materials have been pre-approved.
- G. Initial Compaction Testing shall be performed on each compacted embedment and backfill material layer within the first fifty (50) linear feet of pipe installed. This testing procedure is to provide a demonstration of the compactive effort required to achieve the specified density. Repeat this testing for each new embedment or backfill material used throughout the project.
- H. Periodic Compaction Testing shall be provided a on each compacted embedment and backfill material a minimum of once per week and/or once every 3,000 feet of trench being excavated. The Engineer shall have the authority to order additional tests at anytime if he feels the compactive effort is not being properly duplicated, or to reduce the frequency of testing if the compactive effort has been adequately duplicated.

# 3.15 GRADING

- A. General: Uniformly grade disturbed areas to a smooth surface, free from 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 Grading: Slope grades to direct water away from buildings and trenches and to prevent ponding. Finish subgrades to match pre-existing elevations.

# 3.16 FIELD QUALITY CONTROL

A. Testing Agency: The Contractor shall engage a qualified independent geotechnical engineering testing agency to perform field quality control testing.

B. Allow testing agency to inspect and test subgrades and each backfill layer. Proceed with subsequent earthwork only after test results for previously completed work complies with requirements.

C. Testing agency shall perform tests to ensure that embedment and backfill materials and their placement comply with specified requirements. The following tests shall be required and reported to Engineer:

- Soil Classification: One initial soil classification test, ASTM D 2487 for each type of satisfactory soil embedment or backfill material and one additional test for each 10,000 cubic yards placed of each material.
- a. Initial Soil Classification test shall be reported to the Engineer and approved prior to use of material on project.
- Gradation Test: One initial gradation test, ASTM D 422 for each type of granular embedment or backfill material and one additional test for each 10,000 cubic yards placed of each material.
  - a. Initial gradation tests shall be reported to the Engineer and approved prior to use of material on project.
- Moisture-Density Relations (Proctor): One standard proctor compaction test, ASTM D 698, for each type of material proposed, and one additional test for each 10,000 cubic yards placed of each material.
- 4. In place field density tests of embedment and compacted backfill shall be made as specified elsewhere in this section and according to ASTM D 2922.

D. Sample material tests such as soil classification, gradation and proctor tests shall be conducted no more than 15 days prior to submittal to the Engineer for approval. When material sample submittals are required, the testing agency shall obtain a sample of adequate size, split the sample by approved methods, perform testing on portions of the sample and return a portion of the sample to the Contractor for submittal to the Engineer.

E. Material samples shall be clearly labeled and shall be submitted along with the written reports of testing conducted on that sample. Test reports conducted prior to the Work shall not be accepted unless the material is pre-approved and current certification is provided indicating that the material meets all requirements of the certifying agency.

- F. Testing Agency shall prepare and submit written reports at least once a week. Reports shall detail the material tested, the location test, the lift or elevation of material tested, the percent compaction and moisture content. Test results shall be submitted to the Contractor and Engineer.
- G. When testing agency reports that embedment and backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; re-compact and retest until specified compaction is obtained.
  - A written notice of failure to meet compaction shall be given to the Contractor and Engineer within 24 hours of said test. The report shall detail the location of work, type of material, and the tested percent compaction and moisture content.

# 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 where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
  - Scarify or remove and replace soil material to depth as directed by Engineer; reshape, re-compact, and seed & mulch.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, reconstruct surfacing, and seed & mulch.
  - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

### 3.18 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Transport surplus satisfactory soil to designated storage areas on Owner's property or to an offsite property as approved by Engineer and written authorization of property owner. Stockpile or spread soil on owners property as directed by Engineer.
  - 1. Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

### END OF SECTION 0231000

### SECTION 024113 - REMOVAL OF IMPROVEMENTS

## PART 1 – GENERAL

### 1.1 SUMMARY

- A. Removal of improvements shall include, but is not limited to, removing existing structures, sidewalks, pavement and driveway sections, and drainage pipes and other underground structures or improvements. The plans will not show a complete list or details of all items to be removed. The Contractor shall determine for himself the amount and extent of the work to be performed under this item and shall base his bid accordingly.
- B. Rock Excavation is unclassified and no extra compensation will be allowed for rock excavation.
- C. The use of dynamite or other blasting materials will not be permitted.

### PART 2 – PRODUCTS (NOT USED)

### PART 3 – EXECUTION

### 1.1 CONSTRUCTION PROCEDURES

- A. The Contractor shall dispose of all removed improvements, not to be retained by the Owner, in a legal manner off of the project site.
- B. Areas disturbed by the Contractor outside the limits of construction shall be restored at the Contractors' expense to a condition similar to, or better than, that prior to construction operations.

### **END OF SECTION 024113**

# **SECTION 025100 – WATER DISTRIBUTION PIPING**

### PART 1 - GENERAL

### **1.1 RELATED DOCUMENTS**

A. Drawings and Special Provisions apply to this Section.

### 1.2 SUMMARY

- A. This Section includes water-distribution piping and specialties outside the building for the following:
  - 1. Water services
  - 2. Water mains
  - 3. Fire services
  - 4. Process Piping
- B. Referenced Sections include the following:
  - 1. Section 023100 "Excavating and Backfilling Trenches".
- C. Referenced Standards include the following:
  - 1. AWWA C900 Polyvinyl Chloride (PVC) Pressure Pipe, and Fabricated Fittings, 4 in. through 12 in. (100 mm through 300 mm), for Water Distribution; American Water Works Association; 1997.
  - 2. AWWA C110 ANSI Standard for Ductile-Iron and Gray-Iron Fittings, 3 in. through 48 in. (76 mm through 1,219 mm), for Water; American Water Works Association; 1998.
  - 3. AWWA C151 ANSI Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water; American Water Works Association; 2002.
  - 4. AWWA C153 ANSI Standard for Ductile-Iron Compact Fittings for Water Service; American Water Works Association; 2000.
  - 5. AWWA C111 ANSI Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings; American Water Works Association; 2000.
  - AWWA C509 Resilient-Seated Gate Valves for Water Supply Service; American Water Works Association; 2001.
  - AWWA C540-02 Standard for Power-Actuating Devices for Valves and Slide Gates; American Water Works Association; 2003

- 8. AWWA C550 Protective Epoxy Interior Coatings for Valves and Hydrants; American Water Works Association; 2001.
- 9. AWWA M44 Distribution Valves: Selection, Installation, Field Testing, and Maintenance; American Water Works Association; 1996.
- 10. AWWA C502 Dry-Barrel Fire Hydrants; American Water Works Association; 1994.
- 11. NFPA 1963 Standard for Fire Hose Connections; National Fire Protection Association; 1998.
- 12. ASTM D3139 Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals; American Society for Testing and Materials; 1998.
- 13. NFPA 24 Installation of Private Fire Service Mains and their Appurtenances; National Fire Protection Association; 1995.
- 14. AWWA C600 Installation of Ductile-Iron Water Mains and their Appurtenances; American Water Works Association; 1999.
- 15. AWWA M17 Installation, Field Testing, and Maintenance of Fire Hydrants; American Water Works Association; 1989.

### **1.3 DEFINITIONS**

- A. Fire-Service Main: Exterior fire-suppression-water piping.
- B. Water Main: Exterior water distribution system piping.
- C. Water Service: Exterior domestic-water piping.
- D. Process Piping: Piping used within treatment facilities or used to connect treatment processes.
- E. The following are industry abbreviations for piping materials:
  - 1. PVC: Polyvinyl chloride plastic.
  - 2. DIP: Ductile iron pipe.

### 1.4 SUBMITTALS

- A. Product Data: For the following:
  - 1. Piping
  - 2. Fittings
  - 3. Meters
  - 4. Meter boxes

5. Valves

### 1.5 QUALITY ASSURANCE

- A. Product Options: Drawings indicate size, profiles, and dimensional requirements of piping and specialties and are based on the specific system indicated.
- B. Regulatory Requirements:
  - 1. Comply with standards of authorities having jurisdiction for potable-water-service piping, including materials, installation, testing, and disinfection.
  - 2. Comply with standards of authorities having jurisdiction for fire-suppression water-service piping, including materials, hose threads, installation, and testing.
- C. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- D. NSF Compliance:
  - 1. Comply with NSF 14 for plastic potable-water-service piping. Include marking "NSF-pw" on piping.
  - 2. Comply with NSF 61 for materials for water-service piping and specialties for domestic water.

### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Preparation for Transport: Prepare valves, including fire hydrants, according to the following:
  - 1. Ensure that valves are dry and internally protected against rust and corrosion.
  - 2. Protect valves against damage to threaded ends and flange faces.
  - 3. Set valves in best position for handling. Set valves closed to prevent rattling.
- B. During Storage: Use precautions for valves, including fire hydrants, according to the following:
  - 1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
  - 2. Protect from weather. Store indoors and maintain temperature higher than ambient dew-point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.
- C. Handling: Use sling to handle valves and fire hydrants if size requires handling by crane or lift. Rig valves to avoid damage to exposed parts. Do not use hand wheels or stems as lifting or rigging points.
- D. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- E. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.

- F. Protect flanges, fittings, and specialties from moisture and dirt.
- G. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

## **1.7 PROJECT CONDITIONS**

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
  - 1. Notify Owner not less than two days in advance of proposed utility interruptions.
  - 2. Do not proceed with utility interruptions without Owner's written permission.

# 1.8 PERMITS

1. Contractor shall refer to utility company to obtain all required permits and pay any associated permitting fees prior to commencement of work.

## **1.9 COORDINATION**

A. Coordinate service connections to water main with utility company.

# PART 2 - PART - PRODUCTS

### 2.1 PIPING MATERIALS

A. Refer to Part 3 "Piping Applications" Article for applications of pipe, tube, fitting, and joining materials.

### 2.2 DUCTILE-IRON PIPE AND FITTINGS

- A. Ductile-Iron Pipe: AWWA C151, Class 53 with mechanical-joint, push joint, or flanged joint as indicated. Inside of pipe and fittings shall be lined with cement mortar complying with ANSI A21.4 with a minimum thickness of 1/16th inches.
  - 1. Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern Mechanical joint or flanged joint as indicated.
    - a. Joint Restraint: All buried valves and fittings used on this project shall have restrained mechanical joints. For pipe 4" and larger use the Megalug Series 1100 produced by EBAA Iron Inc. or approved equal. For pipe smaller than 4" use a knuckle type joint and restraint such as that manufactured by HARCO (Harrington Corporation of Lynchburg, Virginia) or approved equal.
- B. Ductile-Iron Flexible Expansion Joints: Compound, ductile-iron fitting with combination of flanged and mechanical-joint ends complying with AWWA C110 or AWWA C153. Include two gasketed ball-joint sections and one or more gasketed sleeve sections. Assemble components for

offset and expansion indicated. Include AWWA C111, ductile-iron glands, rubber gaskets, and steel bolts.

- C. Ductile-Iron Deflection Fittings: Compound, ductile-iron coupling fitting with sleeve and flexing sections for up to 20-degree deflection, gaskets, and restrained-joint ends complying with AWWA C110 or AWWA C153. Include AWWA C111, ductile-iron glands, rubber gaskets, and steel bolts.
- D. Ductile-Iron Expansion Joints: Three-piece, ductile-iron assembly consisting of telescoping sleeve with gaskets and restrained-type, ductile-iron, bell-and-spigot end sections complying with AWWA C110 or AWWA C153. Select and assemble components for expansion indicated. Include AWWA C111, ductile-iron glands, rubber gaskets, and steel bolts.
- E. Exposed Ductile Iron Pipe and Fittings: The coatings on all exposed piping inside buildings or structures shall be un-coated and suitable for painting.

# 2.3 COPPER TUBE AND FITTINGS

- A. Soft Copper Tube: ASTM B 88, Type K, water tube, annealed temper.
  - 1. Copper Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint pressure type. Furnish only wrought-copper fittings if indicated.
  - 2. Bronze Flanges: ASME B16.24, Class 150, with solder-joint end. Furnish Class 300 flanges if required to match piping.
  - 3. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.

### 2.4 PVC PIPE AND FITTINGS

- A. PVC Pressure Pipe: Class 250, SDR 17, for rubber gasketed joints unless otherwise noted on the plans. PVC pressure pipe shall meet the following:
  - 1. Materials: ASTM D 1784.
  - 2. PVC Pressure Rate Pipe: ASTM D 2241.
  - 3. Gaskets: ASTM F 477.
  - 4. Fittings shall be Ductile Iron
- B. PVC, AWWA Pipe: AWWA C900, DR 18 rated at 235 psi, with bell end with gasket and spigot end.
  - 1. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
    - a. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

#### 2.5 GATE VALVES

- A. AWWA, Cast-Iron Gate Valves: Nonrising-Stem, Resilient-Seated Gate Valves: AWWA C509, gray- or ductile-iron body and bonnet; with bronze or gray or ductile-iron gate, resilient seats, bronze stem, and stem nut.
  - 1. Minimum Working Pressure: 250 psig.
  - 2. End Connections: Mechanical joint.
  - 3. Interior Coating: Complying with AWWA C550.

#### 2.6 GATE VALVE ACCESSORIES AND SPECIALTIES

- A. Valve Boxes: Comply with AWWA M44 for cast-iron valve boxes. Include top section, adjustable extension of length required for depth of burial of valve, plug with lettering "WATER," bottom section with base of size to fit over valve, and approximately 5 inch diameter barrel.
  - 1. Operating Wrenches: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and socket matching valve operating nut.

#### 2.7 AIR RELEASE VACUUM VALVES

A. Air release valves shall be of the simple lever type and shall be capable of automatically releasing accumulated air from a fluid system while that system is in operation and under pressure. To assure drop tight shut-off, a viton orifice button shall be used to seal the valve discharge orifice when the valve is in a closed position. The orifice diameter will be sized for use within a given operating pressure range to insure maximum discharge capacity. The body and cover shall be of cast iron. With the exception of the viton orifice button, the leverage mechanism, float, and all other internal trim shall be of stainless steel. The stainless steel float shall be designed to and capable of withstanding a pressure in excess of 1,000 psi. Quality shall be equal to the Val-Matic Models #15, #22, or #25.

#### 2.8 PRESSURE SUSTAINING VALVE

- A. Pressure sustaining valve shall be a commercially made valve with smooth positive pressure regulation designed specifically to maintain a minimum back pressure in the system. The valve will hold a minimum preset upstream value as to not allow the system to drop below the system design condition. Valve shall be adjustable and capable of sustaining a minimum upstream pressure of 40 psi. Valve shall be factory certified as to accuracy of settings. Valve body shall be ductile iron, ASTM A536. Valve shall have bronze internal components with a Buna-N rubber disc and stainless steel hardware. Valve shall be installed in conjunction with the strainer as shown on the plans. A piston operated or rolling diaphragm design will not be permitted.
- B. Valve is shown on the plans as a 4-inch valve, however, valve size shall be adjusted per manufacturer's recommendation for operating conditions.

#### 2.9 PRESSURE REDUCING VALVE

- A. Pressure reducing valves shall be a commercially made valves capable of reducing an inlet pressures as follows:
  - 1. PRV on main incoming line shall reduce a pressure of 145 psi to 180 psi to a steady downstream pressure of 35 psi regardless of flow rate. Flow range is anticipated between 8 gpm and 70 gpm, although conditions of "no flow" will also occur.
  - 2. PRV on at Campground No. 2 shall reduce a pressure of 80 psi to 100 psi to a steady downstream pressure of 60 psi regardless of flow rate. Flow range is anticipated between 0 gpm and 10 gpm.
  - 3. Pressure reducing valve on main line must be rated for anti-cavitation and designed for high pressure differentials.
  - 4. Valve bodies shall be ductile iron, ASTM A536. Valves shall have a 316 stainless disc guide and seat. Valves are shown on the plans as 4-inch and 6-inch valves, however, valve sizes shall be adjusted per manufacturer's recommendation for operating conditions; including flow, pressure change, and friction loss.

#### 2.10 WATER METERS

A. Water meter shall be coordinated through, and meet all the requirements of, Laclede County PWSD # 1. Meter shall meet AWWA requirements.

## 2.11 METER BOXES

- A. Description: Cast-iron body and cover for disc-type water meter with lettering "WATER METER" in cover; and slotted, open-bottom base section of length to fit over service piping.
  - 1. Option: Base section may be cast-iron, PVC, or other pipe approved by the Engineer.
- B. Description: Cast-iron body and double cover for disc-type water meter with lettering "WATER METER" in top cover; separate inner cover; air space between covers; and slotted, open-bottom base section of length to fit over service piping.
- C. Description: Polymer-concrete body and cover for disc-type water meter with lettering "WATER" in cover; and slotted, open-bottom base section of length to fit over service piping. Include vertical and lateral design loadings of 15,000 lb minimum over 10 by 10 inches square.

### 2.12 EXTERIOR PIPE COATINGS

- A. Buried Ductile-iron Pipe: Bituminous coated with either coal tar or asphalt base of approximately one mill thickness.
- B. Exposed pipe: Three coat Alkyd Enamel system.

# PART 3 - PART - EXECUTION

### 3.1 GENERAL

- A. Refer to Division 2 Section 023100 "Excavating and Backfilling Trenches" for excavating, trenching, and backfilling.
- B. Field check all dimensions shown on the plans and the "certified" equipment shop drawings and rectify any discrepancies before starting the work. All existing dimensions shall be verified in the

field. Interferences shall be brought to the attention of the Engineer in writing.

- C. Elevations of underground piping, uniform slope in direction of flow, and installation details shall be as shown on the plans and as specified in the Technical Specifications.
- D. Any damage caused, directly or indirectly, to structures, buildings, equipment, utilities, roadways, and/or sidings shall be repaired or replaced to the satisfaction of the Engineer.
- E. When obstructions that are not shown on the plans are encountered during the progress of work and interfere so that an alteration of the plans is required, the Owner, through the Engineer, will alter the plans or order a deviation in line and grade or arrange for removal, relocation, or reconstruction of the obstructions.
- F. When crossing existing pipelines or other structures, alignment and grade shall be adjusted as necessary, with the approval of the Owner, to provide clearance as required by federal, state, or local regulations or as deemed necessary by the Owner to prevent future damage or contamination of either structure.

### 3.2 SEPERATION OF WATER MAINS AND SANITARY SEWERS

- A. Horizontal Separation: Where potable water lines are to be laid parallel to existing or proposed sanitary sewers, it will be necessary to maintain at least ten (10') feet horizontal separation, edge of pipe to edge of pipe, between the gravity and pressure sewer lines and water lines. Pressure sewer line and water lines shall be laid in separate trenches.
  - In cases where the minimum horizontal separation cannot be obtained, water mains shall be laid in a separate trench or on an undisturbed earth shelf at such elevation where the bottom of the water main shall be at least eighteen inches (18") above the top of the sewer line. The Contractor shall notify the Engineer when minimum horizontal separations cannot be attained.
- B. Vertical Separation: Water mains crossing sewers either above or below shall have a minimum of eighteen inches (18") vertical separation from edge of pipe to edge of pipe.
  - In cases where the minimum vertical separation cannot be obtained, water mains shall be constructed of mechanical joint PVC or ductile iron pipe with joints at least ten (10') feet each direction from the crossing point or cased in continuous casing that extends at least 10 feet (10') in each direction of the crossing point. The Contractor shall notify the Engineer when minimum vertical separations cannot be attained.
- C. Separation from Sewer Manholes: Water lines shall be laid with a minimum horizontal clearance of ten feet (10') to any sewer manhole. The Contractor shall notify the Engineer if field conditions are such that the minimum separation cannot be obtained before continuing with construction.

### **3.3 PIPING APPLICATIONS**

A. General: Use pipe, fittings, and joining methods for piping systems according to the following applications.

- B. Use full lengths of pipe where length between fittings is less than the Mill-random lengths of pipes. Extra joints shall be avoided.
- C. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used in applications below, unless otherwise indicated.
- D. Do not use flanges, unions, or keyed couplings for underground piping.
- E. Underground Water Service Piping: Use the following:
  - 1. Use NPS 3/4 to NPS 2-1/2: Soft copper tube, Type K; wrought-copper fittings; and soldered joints or HDPE DR 9. All service lines shall be rated for potable water systems.
  - 2. NPS 4: Ductile-iron or PVC push joint or mechanical joint pipe.
- F. Underground Water Distribution Piping: Use pipe as designated on the plans, or one of the following:
  - 1. Ductile-iron, push joint or mechanical-joint pipe.
  - 2. PVC, SDR 17 Class 250 pipe and gasketed joints.
  - 3. PVC, C900, flanged joints and ductile iron flanged fittings.

## 3.4 VALVE APPLICATIONS

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
  - 1. Underground Valves, NPS 3 and Larger: AWWA, cast-iron, nonrising-stem, resilient-seated gate valves with valve box.

### 3.5 JOINT CONSTRUCTION

- A. Make pipe joints according to the following:
  - 1. Copper Tubing Soldered Joints: ASTM B 828. Use flushable flux and lead-free solder.
  - 2. PVC Piping Gasketed Joints: Use joining materials according to AWWA C900. Construct joints with elastomeric seals and lubricant according to or ASTM D 3139 and pipe manufacturer's written instructions.
  - 3. Dissimilar Materials Piping Joints: Use adapters compatible with both piping materials, with OD, and with system working pressure.

### 3.6 PIPING INSTALLATION

- A. Inspect each pipe for defects:
  - 1. Rung ductile iron pipe with a light hammer to detect cracks.

- 2. Examine PVC pipe for visible cracks, holes, or foreign materials.
- 3. All defective, damaged, or unsound pipe and fittings shall be rejected and removed from the site.
- B. The trench shall be so excavated that the pipe, when laid, shall have a true and even bearing on its full length. Excavation of bell holes will be required such that even bearing is achieved. Pipe, fittings, and valves shall be placed in the trench with care and under no circumstances shall pipe or other materials be dropped or dumped into the trench.
- C. Field cutting ductile iron pipe:
  - 1. Use Mechanical pipe cutters.
  - 2. Cuts shall be smooth, straight, and at right angles to the pipe axis.
  - 3. Cutting shall not damage the pipe or lining.
- D. Field cutting PVC pipe:
  - 1. Bevel exterior edge of pipe cuts to prevent damage to gasket.
- E. Bury piping with depth of cover over top at least 42 inches, with top at least 12 inches below level of maximum frost penetration, and according to the following:
  - 1. Under Driveways: With at least 42 inches cover over top.
  - 2. Under Railroad Tracks: With at least 48 inches cover over top.
  - 3. In Loose Gravelly Soil and Rock: With at least 12 inches additional cover.
- F. Install copper tube and fittings according to CDA's "Copper Tube Handbook."
- G. Comply with NFPA 24 for fire-service-main piping materials and installation.
- H. Extend water-service piping and connect to water-supply source, terminating 10 feet outside building line in locations and pipe sizes indicated.
  - 1. Terminate piping with caps, plugs, or flanges as required for piping material.
  - 2. Connect water-service piping to building distribution piping when systems are in place.
- I. Install underground piping with restrained joints at horizontal and vertical changes in direction. Use restrained-joints as specified above.
- J. Anchor service-entry piping to building wall.

### 3.7 UNFORESEEN OBSTRUCTIONS

A. Notify the Owner through the Engineer of any obstructions encountered, which are not shown onWATER DISTRIBUTION PIPINGPROJECT NO. X1807-01025100 - 10

the plans and interfere so that an alteration of the plans is required. The Owner through the Engineer will alter the plans or order a deviation in line and grade or arrange for the removal, relocation, or reconstruction of the obstruction.

## 3.8 EXPOSED PIPE FINISHING

- A. Ductile-iron Pipe: all DIP to remain exposed shall be sandblasted to remove the bituminous coating and painted.
  - 1. Color shall be as indicated or as selected by the Owner.
- B. Non-coated pipe need not be sandblasted provided that it is factory primed and free of rust or other deleterious substances.
- C. Application of exterior pip coatings shall be according to Section 09912 "Painting".

## 3.9 LAYING PIPE ON CURVES

- A. Long radius curves, either horizontal or vertical, may be laid with standard pipe by deflections at the joints for most "rigid" pipe and in the pipe for most "flexible" pipe. If the pipe is shown curved on the plans and no abrupt change in alignment is shown, it may be assumed that the curves can be made by deflection of the joints with standard lengths of pipe. It may be required to decrease laying lengths to construct deflection at a reduced radius of curvature.
- B. Where field conditions require deflection of curves not anticipated by the plans, the Engineer will determine the methods to be used. No additional payment will be made for laying pipe on curves as shown on the plans, nor for field changes involving standard lengths of pipe deflected at the joints.
- C. Maximum deflections at pipe joints and laying radius for the various pipe lengths are as found in the following standards (latest revisions):
  - 1. Ductile Iron Pipe, Mechanical Joints: ANSI/AWWA C600.
  - 2. Ductile Iron Pipe, Push on Joints: ANSI/AWWA C600.
  - 3. Polyvinyl Chloride (PVC) Pipe: AWWA 900.
- D. When rubber gasket pipe is laid on a curve, the pipe shall be jointed in a straight alignment and then deflected to the curved alignment. Trenches shall be made wider on curves for this purpose.

### 3.10 ANCHORAGE INSTALLATION

- A. Use restrained-joints as specified on the project plans.
- B. Apply full coat of asphalt or other acceptable corrosion-resistant material to surfaces of installed ferrous anchorage devices.

### 3.11 VALVE INSTALLATION

- A. Inspect all gate valves and fittings upon delivery in the field to insure proper working order before installation. They shall be set and jointed to the pipe in accordance with the latest revisions of AWWA Standards for the type of connection ends furnished.
- B. Buried valves shall be installed in a vertical position and be provided with a standard cast iron valve box so arranged that no shock will be transmitted to the valve. The box shall be vertically centered over the operating nut and the cast iron box cover shall be set flush with the road bed or finished surface. A concrete base shall be poured around the valve box cover as detailed on the plans.
- C. After installation, all valves shall be subjected to the field test specified herein. Should any defects in materials or workmanship appear during these tests, correct such defects with the least possible delay and to the satisfaction of the Engineer.

# 3.12 WATER-METER INSTALLATION

A. Arrange with utility company to install water-meter as shown on the plans. Contractor shall be responsible for cost of materials, permits required, and installation of water meter under the direct supervision of Laclede County PWSD # 1 personnel.

# 3.13 CONNECTIONS

- A. Water-Main Connection: Contractor to arrange with utility company prior to installing water taps into existing mains. Contractor shall be responsible for cost of materials, permits required to make connections, and installation of tap under the direct supervision of Laclede County PWSD # 1 personnel.
- B. Connect all other piping to existing and proposed systems as shown on the plans.

# 3.14 FIELD QUALITY CONTROL

- A. Piping Tests: The Contractor shall conduct piping tests on all piping systems before joints are covered and after thrust blocks have hardened sufficiently. Piping equipment and instruments which will not safely withstand the test pressures shall be isolated or removed before testing. Provide spool pieces for any piping, equipment, or instruments removed for testing. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.
- B. Perform all tests in the presence of the Engineer or the Engineer's authorized representative.
- C. Hydrostatic Tests: Test at 1-1/2 times working pressure (but not less than 150 psi) for 2 hours. Test pressure to be maintained within 5 psi of 1-1/2 times working pressure.
  - 1. Increase pressure in 50-psig increments and inspect each joint between increments. Hold at test pressure for 2 hour; decrease to 0 psig. Maximum allowable leakage is determined by utilizing the following formula:

L = (ND\*SQRT(P))/7400

Where; L = allowable leakage, in gallons per hour

N = number of joints in the length of pipeline tested

D = nominal diameter of the Pipe, in inches

- P = average test pressure during leakage test, in pounds per square inch (psi)
- 2. Remake leaking joints with new materials and repeat test until leakage is within allowed limits.
- D. It is the intent of this specification that all joints shall be watertight and free from visible leaks. Any leak discovered within one (1) year after the date of final acceptance of the work shall be repaired by, and at the expense of, the Contractor.
- E. Prepare a test report based on the satisfactory completion of the hydrostatic test of each piping system or portion of the system. The report shall establish the exact limits of the test. This report shall contain the following:
  - 1. Test pressure at the beginning and end of the test.
  - 2. Time interval of the test.
  - 3. Marked-up set of flow diagrams:
    - a. Sections of pipe shall be yellowed-out and initialed by the Contractor and Engineer, or his representative, as they are tested.
    - b. The Contractor shall be responsible for maintaining this set of flow diagrams, which shall be given to the Engineer at the completion of the job.

# 3.15 IDENTIFICATION

- A. Install continuous underground detectable warning tape during backfilling of trench for underground water-service piping. Locate below finished grade, directly over piping. See Division 2 Section 02310 "Excavating and Backfilling Trenches" for underground warning tapes.
- B. Install locator wire immediately above pipe to valves and risers at buildings.
- C. Install Carsonite markers, or approved equal, no more than 750 feet apart as shown on plans.

# 3.16 CLEANING

- A. Clean and disinfect water-distribution piping as follows:
  - 1. Purge new water-distribution piping systems and parts of existing systems that have been altered, extended, or repaired before use.
  - Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in AWWA C651 or as described below:

chlorine; isolate and allow to stand for 24 hours.

- b. Drain system or part of system of previous solution and refill with water/chlorine solution containing at least 200 ppm of chlorine; isolate and allow to stand for 3 hours.
- c. After standing time, flush system with clean, potable water until no chlorine remains in water coming from system.
- d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedure if biological examination shows evidence of contamination.
- B. Prepare reports of purging and disinfecting activities.
- C. Flushing
  - After installation and before use by the public, the Contractor shall disinfect the potable water lines. Sections of pipe to be disinfected shall first be flushed to remove any solids or contaminated material that may have become lodged in the pipe. If no hydrant is installed at the end of the main, then a tap should be provided large enough to develop a velocity of at least two and five-tenths (2.5) feet per second in the main. One two and one-half (2 1/2) inch hydrant opening will, under normal pressures, provide this velocity in pipe sizes up to and including twelve inches.
  - 2. All taps required for chlorination or flushing purposes, or for temporary or permanent release of air shall be provided for by the Contractor as a part of the construction of water mains.
- D. Chlorine Requirements
  - 1. Before being placed into service, all new mains and repaired portions of, or extensions to, existing mains shall be chlorinated so that a chlorine residual of not less than twenty-five (25) mg/l remains in the water after standing twenty-four (24) hours in the pipe.
  - 2. A chlorine gas-water mixture shall be applied by means of a solution-feed chlorinating device, or the dry gas may be fed directly through proper devices for regulating the rate of flow and providing effective diffusion of the gas into water within the pipe being treated. Chlorinating devices for feeding solutions of the chlorine gas, or the gas itself, must provide means for preventing the backflow of water into the chlorine.

3. A mixture of water and high-test calcium hypochlorite (HTH, 60 - 70% Chlorine) may be substituted for the chlorine gas water mixture. The dry powder shall first be mixed as a paste and then thinned to a one (1) percent chlorine solution by adding water to give a total quantity of seven and five-tenths (7.5) gallons of water per pound of dry powder. This solution shall be injected in one end of the section of main to be disinfected while filling the main with water in the amounts as shown in the following table:

Concentration in 100 feet of pipe (by diameter)				
Pipe Size (inches)	100%	1%		
· · ·	Chlorine, lbs.	Solution, Gals.		
4	0.027	0.33		
6	0.061	0.73		
8	0.108	1.30		
10	0.170	2.04		
12	0.240	2.88		

Chlorine requirements to produce 50 mg/l

- 4. Tablet disinfection is best suited to short extensions (up to 2500 ft.) and smaller diameter mains (up to 12 inch). Because preliminary flushing must be eliminated in using this method, it should be utilized only when scrupulous cleanliness has been used in construction. It shall not be used if trench water or foreign material has entered the main or if the water is below 41° F.
- 5. Tablets should be placed in each section of pipe, hydrants, hydrant branches, and other appurtenances. Tablets must be at the top of the main, and shall be attached by an adhesive such as Permatex Number 1, or any alternative approved by the Engineer. Tablets in joints between pipe sections, hydrants, hydrant branches, or appurtenances shall be crushed and placed inside the annular space or rubbed like chalk in butt ends of sections to coat them if the type of assembly does not permit crushing.

6. When using the tablet method, water velocity shall be less than one (1) foot per second during the filling of the section of piping with water.

Pipe Size (inches)	Length of Pipe Section (Feet)				
(menes)	Up to 13	18	20	30	40
2	1	1	1	1	1
4	1	2	2	2	2
6	2	2	3	3	4
8	2	3	5	5	6
10	3	5	7	7	9
12	5	6	10	10	14

Number of 5-Grain Hypochlorite Tablets Required or a Dosage of 50 mg/l per Length of Pipe Section

- 7. Disinfectant Application
  - a. The preferred point of application of the disinfectant is at the beginning of the pipe line extension or any valved section of it, and through a corporation stop inserted in the pipe. The water injector for delivering the chlorine-bearing water into the pipe should be supplied from a tap made on the pressure side of the gate valve controlling the flow into the pipe line extension. Alternate points of application may be used when approved or directed by the Engineer.
  - b. Valves shall be manipulated so that the strong chlorine solution in the line being treated will not flow back into the line supplying the water. Check valves may be used if desired.
  - c. Treated water shall be retained in the pipe for at least twenty-four (24) hours. After this period, the chlorine residual at pipe extremities and at other representative points shall be at least twenty-five (25) mg/l.
  - d. In the process of chlorinating newly laid pipe, all valves or other appurtenances shall be operated while the pipe line is filled with the chlorinating agent and under normal operating pressure.
- 8. Final Flushing and Testing
  - a. Following chlorination, all treated water shall be thoroughly flushed from the newly laid pipe at its extremity until the replacement water throughout its length shows upon test, a chlorine residual of less than 1 mg/l. In the event chlorine is normally used in the source of supply, then the tests shall show a residual of not in excess of that carried in the system.
  - b. Prior to release, all chlorinated water shall be de-chlorinated utilizing methods and materials acceptable to regulatory authorities and the Owner. De-chlorination and flushing shall meet the requirements of both the Missouri Department of Natural Resources and the EPA. In no case shall chlorinated water be released into the waters of the State of Missouri.
  - c. After flushing, water samples collected on two (2) successive days from the treated piping system, as directed by the Engineer, shall show satisfactory bacteriological results. Bacteriological analysis must be performed by a laboratory approved by the Missouri Department of Natural Resources. The Contractor shall be responsible for securing, delivering, and testing of all samples.
  - d. Should the initial treatment result in an unsatisfactory bacteriological test, the original chlorination procedure shall be repeated by the Contractor until satisfactory results are obtained.

### END OF SECTION 025100

# SECTION 029250 - PERMANENT EROSION CONTROL AND LANDSCAPING

# PART 1 - GENERAL

### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Seeding
  - 2. Mulching
- B. Referenced Sections include the following:
  - 1. Section 022300 "Site Clearing".
  - 2. Section 015723 "Temporary Erosion, Siltation, and Storm Water Pollution Control".
- C. Referenced Standards include the following:
  - 1. ASTM D 5268 Standard Specification for Topsoil Used for Landscaping Purposes; American Society for Testing and Materials; 1992 (Re-approved 1996).
  - 2. ASTM C 602 Standard Specification for Agricultural Liming Materials; American Society for Testing and Materials; 1995a (Re-approved 2001).

# **1.2 DEFINITIONS**

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

# **1.3 SUBMITTALS**

- A. Tree Planting Plan: Submit detailed layout and arrangement of proposed tree plantings.
- B. Material Certificates for the following:
  - 1. Seed
  - 2. Mulch Overspray

PERMANENT EROSION CONTROL AND LANDSCAPING PROJECT NO. X1807-01
3. Erosion Control Blankets

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful lawn establishment.
  - 1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

A. Seed: Deliver seed in original sealed, labeled, and undamaged containers.

#### 1.6 SCHEDULING

- A. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.
- B. Season: Plant seed/seedlings during seasons that will best ensure permanent establishment of grass/trees.
  - Cool season grasses: If planting is performed during the months of June, July, October or November, plant only 75 percent of the specified quantity of seed and then overseed during the months of August, September, December, January or February. If planting is performed during the months of December through May, August, or September, all seed may be planted at one time. Contractor will still be responsible for overseeding areas that may not establish.

#### 1.7 LAWN MAINTENANCE

- A. Begin maintenance immediately after each area is planted and continue until plants are established, but for not less than the following periods:
  - 1. Seeded Lawns: 60 days following completion of seeding activities.
    - a. When full maintenance period has not elapsed before end of planting season, or if lawn is not fully established, continue maintenance during next planting season.
- B. Maintain and establish lawn by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn.
  - 1. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch. Anchor as required to prevent displacement.

## PART 2 - PRODUCTS

#### 2.1 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with the requirements of the Missouri Seed Law. The percentages for purity and germination or pure live seed shall conform to Missouri Standard Specification for Highway Construction Section 805.
- B. Seed Species Mixes: State-certified seed of grass species, as follows:
  - 1. Tall Fescue Mix:
    - a. 55 lbs/acre Tall Fescue
    - b. 15 lbs/acre Annual Rye
    - c. 5 lbs/acre White Clover
  - 2. Native Grasses Mix:
    - a. 30 lbs/acre Wheat
    - b. 8 lbs/acre Tall Fescue
    - c. 6 lbs/acre Big Bluestem
    - d. 6 lbs/acre Little Bluestem
    - e. 3 lbs/acre Sideoats Grama
    - f. 6 lbs/acre Indiangrass
    - g. 1 lbs/acre Switchgrass

#### 2.2 TOPSOIL

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 2 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.
  - 1. Topsoil Source: Reuse surface soil stockpiled on-site. Verify suitability of stockpiled surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
    - a. Supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient. Obtain topsoil displaced from naturally well-drained sites where topsoil occurs at least 4 inches deep; do not obtain from bogs or marshes.

#### 2.3 INORGANIC SOIL AMENDMENTS

- A. Lime: ASTM C 602, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent and as follows:
  - 1. Class: Class T, with a minimum 99 percent passing through No. 8 sieve and a minimum 75 percent passing through No. 60 sieve.
  - 2. Application Rate: 1000 lb per acre, or other application rate based on a soil analysis, as approved by the ENGINEER.

## 2.4 FERTILIZER

- A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
  - 1. Tall Fescue Mix:
    - a. Nitrogen: 80 lbs per acre.
    - b. Phosphoric acid: 160 lbs per acre.
    - c. Potash: 160 lbs per acre.
  - 2. Native Grass Mix:
    - a. Nitrogen: 40 lbs per acre.
    - b. Phosphoric acid: 80 lbs per acre.
    - c. Potash: 80 lbs per acre.

## 2.5 MULCHES

- A. Vegetative Mulch with an Overspray for Seeded Areas
  - Mulch: Prairie hay (any combination of Big Bluestem, Little Bluestem, Indeangrass, Sideoats Grama, native wildflowers) or straw (from oats, rye, wheat or barley). Mulch shall be clean and bright, relatively free of foreign material and dry enough to spread properly. Mulch shall be free of prohibited weed seed as stated in the Missouri Seed Law and shall be relatively free of all other noxious and undesirable seed.
  - 2. Overspray: Virgin wood cellulose fibers or recycled slick paper conforming to requirements of Section 802 of Missouri Standard Specifications for Highway Construction. Material must not contain any germination-inhibiting or growth-inhibiting substances. Overspray shall be green in color after application and shall be evenly dispersed and suspended when agitated in water. Fibers shall not be water soluble.

- B. Embedded Mulch for Seeded Areas
  - 1. Mulch, as specified in 2.5(A)(1) above, embedded into the soil by use of a disk-type roller having flat serrated disks spaced not more than 10 inches.

## 2.6 EROSION-CONTROL BLANKETS

A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.

## PART 3 - EXECUTION

## 3.1 EXAMINATION

A. Examine areas to receive grass and trees for compliance with requirements and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 PREPARATION**

- A. A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
- B. B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

#### **3.3 SUBGRADE PREPARATION**

- A. Limit subgrade preparation to areas to be planted.
- B. Newly Graded Subgrades: Remove stones larger than 2-inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property. Apply 3 inches (plus/minus 1 inch) of topsoil on all newly graded subgrades to be planted. Incorporate topsoil by disking to a depth of 5 inches from the final surface.
  - 1. Apply fertilizer and lime to topsoil before disking.
    - a. Delay mixing fertilizer with soil if planting will not proceed within a few days.
    - b. Mix lime with dry soil before mixing fertilizer.

- 2. If planting soil mix is used, spread mix to a depth of 4 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
  - a. Spread approximately one-half the thickness of planting soil mix over loosened subgrade. Mix thoroughly into top 2 inches of subgrade. Spread remainder of planting soil mix.
- C. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus ½ inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future.
- D. Restore areas if eroded or otherwise disturbed after finish grading and before planting.

## 3.4 SEEDING

- A. Application: Use the seed species mix as defined in Paragraph 2.1 of this Section for each of the following applications:
  - 1. Within 20 feet of Edge of Pavement: Tall Fescue Mix.
  - 2. Residential or commercial lawns: Tall Fescue Mix.
  - 3. Natural fields or pastures: Native Grasses Mix.
  - 4. Cultivated fields or grazing pastures: as approved by property owner and Engineer to minimize conflicts with exiting or proposed crop.
- B. Sow seed with spreader or seeding machine (hydraulic seeding methods not allowed). Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
  - 1. Do not use wet seed or seed that is moldy or otherwise damaged.
- C. Sow seed at the rates given in Paragraph 2.1.B of this Section.
- D. Rake seed lightly into top 1/8 inch of topsoil and roll lightly.
- E. Protect seeded areas with slopes steeper than 3H:1V with embedded mulch or erosion-control blankets installed and stapled according to manufacturer's written instructions.
- F. Protect seeded areas with slopes steeper than 6H:1V by use of embedded mulch or vegetative mulch with overspray.

## 3.5 SATISFACTORY ESTABLISHMENT OF GRASSES

A. Grasses

- 1. At end of maintenance period, a healthy, uniform, close stand of grass shall have been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.
- 2. Reestablish lawns that do not comply with requirements and continue maintenance until lawns are satisfactory.

## 3.6 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris created by lawn work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Erect barricades and warning signs as required to protect newly planted areas from traffic. Maintain barricades throughout maintenance period and remove after lawn is established.
- C. Remove temporary erosion-control measures, as required, after grass establishment period.

#### END OF SECTION 029250

# SECTION 032111 – STEEL REINFORCEMENT BARS

#### PART 1 – GENERAL

#### **1.1 SUMMARY**

This work shall consist of providing all materials, labor and equipment necessary for the placement of reinforcing steel in accordance with the plans and/or as herein specified.

#### PART 2 – PRODUCTS

#### **2.1 MATERIALS**

A. <u>Reinforcing Steel</u>. Reinforcing shall be deformed bars meeting the requirements of AASHTO M31, Grade 60.

#### **PART 3 - EXECUTION**

Under no circumstances shall concrete be poured until the steel placement is approved by Darren Krehbiel Consultants, LLC.

The ends of all reinforcing bars shall be hooked unless specifically noted to the contrary on the drawings or in places where hooks are not feasible because of other construction conditions.

The metal reinforcement shall be protected by the thickness of concrete indicated in the plans. Where not otherwise shown, the thickness of concrete over the reinforcement shall be as follows:

- 1. Where concrete is deposited against the ground without the use of forms, not less than 3 inches.
- Where concrete is exposed to the weather, or exposed to the ground but placed in forms, not less than 2 inches for bars more than 5/8 inches in diameter and 1½ inches for bars 5/8 inches or less in diameter.
- 3. In slabs and walls not exposed to the ground or to the weather, not less than  $1\frac{1}{2}$  inches.
- 4. In beams, girders and columns not exposed to the ground or to the weather, not less than  $1\frac{1}{2}$  inches.
- 5. In all cases, the thickness of concrete over the reinforcement bars shall be at least equal to the diameter of the bars.
- 6. Exposed reinforcement bars intended for bonding with future extensions shall be protected from corrosion by concrete or other adequate covering.

All reinforcement shall be free from rust, scale or other coatings that will destroy or reduce the bond of the concrete to the steel. Where there may be a delay in depositing concrete, the reinforcement shall be reinspected and when necessary, cleaned to the satisfaction of Darren Krehbiel Consultants, LLC.

Anchor bolts for all equipment shall be provided and placed in the concrete in accordance with the manufacturer's directions. Unless otherwise noted, dowels or continuous reinforcement shall be provided at all construction joints. The dowels shall be of the same size as the largest reinforcing bar and shall provide a minimum lap of 24 dowel diameters. Corner bars shall be used at the outside of all corners. Corner bars shall be lapped a minimum of 24 diameters.

## END OF SECTION 032111

# SECTION 033053 - MISCELLANEOUS CAST-IN-PLACE CONCRETE

## PART 1 – GENERAL

#### 1.1 SUMMARY

The work to be performed under this section of the specifications shall consist of furnishing all labor, materials and equipment necessary to complete the construction of all concrete structures in accordance with the plans and/or as herein specified, including all necessary excavation, fill and testing.

#### **1.2 QUALITY ASSURANCE**

- A. Employ acceptable testing laboratory to perform materials evaluation, testing and design of concrete mixes. Testing shall comply with:
  - 1. Sampling: ASTM C 172
  - 2. Slump: ASTM C 143
  - 3. Air Content: ASTM C 173
  - 4. Compressive Strength: ASTM C 39

The General Contractor shall submit his proposed methods for curing of concrete to the Engineer for approval not less than 10 days prior to placement of any concrete.

- B. Concrete materials shall comply with these standards:
  - 1. Portland Cement: ASTM C 150, Type as required.
  - 2. Aggregates: ASTM C 33 Normal Weight
  - 3. Water: Potable.
  - 4. Air-Entraining Admixture: ASTM C 260.
  - 5. Deformed Reinforcing Bars: ASTM A 615, Grade 60.
  - 6. Welded Wire Fabric: ASTM A 185.
  - 7. Ready-Mix Concrete: ASTM C 94.
  - 8. Placement in Cold Weather: ACI 306.
  - 9. Placement in Hot Weather: ACI 305.
- C. Quality control is the responsibility of the Contractor. The above testing in no way relieves the Contractor of the responsibility to comply with the specifications.

D. Calcium chloride shall not be permitted.

E. All concrete used shall have a minimum strength of 4,500 psi.

## PART 2 – PRODUCTS

#### **2.1 MATERIALS**

A. <u>Portland Cement.</u> Portland Cement used in this work shall conform to the latest specifications of the American Society for Testing Materials (ASTM C150), Type I and III. All cement shall be tested before use. Tests shall conform to the latest standards of the American Society for Testing Materials and a report of cement tests shall be made available to Darren Krehbiel Consultants, LLC at least 14 days before the placement of any concrete on the project. When the temperature of air is near freezing, it is recommended that the Contractor use high early strength Portland Cement (Type III).

B. <u>Fine Aggregate.</u> Fine aggregate shall consist of sand having clean, hard, durable uncoated grains, free from deleterious substances. Fine aggregate shall range in size from fine to coarse within the following percentage by weight: (ASTM C 117 and ASTM C 136)

Passing 3/8"	sieve	100%	
Passing #4	sieve	95 to 100%	
Passing #8	sieve	80 to 100%	
Passing #16	sieve	50 to 80%	
Passing #20	sieve	40 to 75%	
Passing #30	sieve	25 to 60%	
Passing #50	sieve	5 to 30%	
Passing #100	sieve	0 to 10%	
The limits of deleterious substances are as follows:			
Percent by Weight			
Clay lumps (ASTM C142)		2)	0.25
Material finer than No. 200 sieve (ASTM C 117)			2.0
Coal and Lignite (ASTM C 40)			0.25

And as further provided in section 1005.2.1 of the Missouri Standard Specifications for Highway Construction.

Fine aggregate shall be free of injurious amounts of organic impurities. Except as herein provided, aggregatessubjected to the test for organic impurities and producing a color darker than the standard shall be rejected. Afine aggregate failing in the test may be used provided that the discoloration is due principally to the presenceMICELLANEOUS CAST-IN-PLACE CONCRETEPROJECT NO. X1807-01033053 - 2

of small quantities of coal, lignite, or similar discrete particles (ASTM C 40). Fine aggregate subjected to five cycles of the soundness test shall show a loss not greater than 10 percent when sodium sulfate is used or 15 percent when magnesium sulfate is used (ASTM C 88).

C. <u>Coarse Aggregate.</u> Coarse aggregate shall consist of well graded, clean, hard, tough, durable crushed stone or washed gravel. It shall be free from soft, thin, elongated, fossil or laminated pieces, disintegrated stone, vegetable or other deleterious matter. In no case shall coarse aggregate containing lumps of frozen or partially cemented materials be used. Coarse aggregate shall be well graded from coarse to fine within the following percentages by weight:

Passing 1 <sup>1</sup> / <sub>2</sub> "	sieve	100%
Passing 1"	sieve	95 to 100%
Passing 3/4"	sieve	70 to 90%
Passing <sup>1</sup> / <sub>2</sub> "	sieve	25 to 60%
Passing 3/8"	sieve	10 to 30%
Passing # 4	sieve	0 to 8%
Passing #10	sieve	0 to 3%

The maximum size of coarse aggregate shall, in any case, be not larger than one-fifth the narrowest dimensions between forms of the members to be poured, nor larger than three-fourths of the clear distance between the reinforcing bars and imbedded items.

The limits for deleterious substances are as follows:

Percent by weight

Clay lumps (ASTM C142)	1.0
Material finer than No. 200 sieve (ASTM C 117)	1.0
Coal and Lignite (ASTM C 40)	0.5

Coarse aggregate subjected to five cycles of the soundness test shall show a loss not greater than 8 percent when sodium sulfate is used or 10 percent when magnesium sulfate is used (ASTM C 88).

Coarse aggregate tested for abrasion shall have a loss of not more than 40%. (ASTM C 131 or ASTM C 535).

All aggregate used on this project shall undergo the above tests and reports of the results shall be made available to Darren Krehbiel Consultants, LLC. No aggregate shall be used without prior approval of test results from Darren Krehbiel Consultants, LLC. Tests shall be scheduled at least 14 days in advance of the scheduled pouring of concrete.

D.Water. Mixing water shall be free from oil, acid, and injurious amounts of vegetable matter, alkali or<br/>other salts. Water known to be of potable quality may be used without testing.MICELLANEOUS CAST-IN-PLACE CONCRETEPROJECT NO. X1807-01033053 - 3

E. <u>Admixtures.</u> An air-entraining agent shall be used in all concrete. All mixtures shall conform to ASTM C-260 and shall be added to the mixer in the amount necessary to produce the specified air content. The designated quantity of air by volume shall be 5 ½ percent with an operating tolerance of 1 ½ percentage points. The Contractor shall submit certificates indicating that the air-entraining agent meets all of the requirements. The Contractor may be required to submit complete test data from an approved laboratory showing that the material to be furnished meets all of the requirements of the cited specifications. Other admixtures may be used on approval by Darren Krehbiel Consultants, LLC. All certificates and any test data required shall be submitted at least 14 days before the scheduled date for concrete pouring.

- F. <u>Cover Material for Curing.</u> Curing materials shall conform to one of the following specifications:
  - 1. Liquid membrane-forming compounds ASTM C 309, Type 2.
  - 2. White polyethylene film ASTM C 171.
  - 3. White burlap-polyethylene sheeting ASTM C 171.
  - 4. <u>Waterproof paper</u> ASTM C 171.

The Contractor shall furnish manufacturer's certificates indicating that the cover material selected meets all of the requirements for the cited specifications. Such certificates shall be furnished to Darren Krehbiel Consultants, LLC at least 45 days before the scheduled date for concrete pouring.

## G. <u>Concrete Proportions</u>

1. <u>Proportion Ingredients.</u> Unless otherwise specified or indicated on the plans, concrete shall be made of Portland Cement, fine aggregate, coarse aggregate, water and an air-entraining agent as specified under Section 033053 - 2.1 - E. The Contractor shall supply a concrete design mix to Darren Krehbiel Consultants, LLC at least 21 days prior to the scheduled date of concrete pour. The Contractor shall include in the design mix report test results from a trial batch, to include aggregate gradation, slump, air content, 7 day and 28 day strengths.

Designed mixtures shall be based upon sieve analysis of the aggregates available. In no case shall less than six sacks of cement per cubic yard of concrete be used to obtain the desired strength of 4,500 pounds per square inch. The method of measuring concrete materials in batch-mixes or at ready-mix plants shall be by weight and shall be such that the proportions can be accurately controlled and easily checked at any time during the work.

The above mixtures are stated by volume. Measured quantities shall be placed in mixtures by equivalent weight with due allowances for moisture in the aggregate and bulging of sand.

2. <u>Water-Cement Ratio.</u> The proportioning of materials shall be based on the requirements of a workable mix containing not more than six gallons of water per sack of cement. Water in the aggregate must be included in the quantity of water specified and shall be subtracted from the amount of water not exceeding that of the approved design mix.

Moisture in the aggregate shall be measured daily during placing of concrete by methods satisfactory to Darren Krehbiel Consultants, LLC and the specified quantity of water shall be adjusted accordingly to provide for a total amount of water not exceeding that of the approved design mix.

3. <u>Workability.</u> The consistency of the concrete shall be such that the concrete can be readily worked around reinforcing bars and into all angles and corners when vibrated. The slump of the concrete shall not be less than two inches nor more than four inches. The methods of measuring the slump shall conform to ASTM C 143. Darren Krehbiel Consultants, LLC shall reject any truckload having a slump greater than that specified above. The Contractor shall remove the concrete already placed from such rejected load at his own expense.

# PART 3 - EXECUTION

A. <u>Control of Concrete Mixes.</u> The concrete shall be tested for strength, air entrainment, temperature, and slump. The Contractor will retain the services of an approved testing firm, and shall be responsible for scheduling the tests. The Contractor shall be required to notify the owner's representative a minimum of 48 hours prior to all placement of concrete.

The Contractor shall be responsible for making and curing concrete test cylinders (ASTM C 31). Curing of the cylinders will be by covering with approved cover material specified in Section 033053 - 2.1 - F. During the first 24 hours all test specimens shall be stored under conditions that maintain the temperature immediately adjacent to the specimens in the range of 60°F to 80°F and prevent loss of moisture. After 48 hours test specimens shall be removed from the field to the testing laboratory.

Care shall be taken during transport to prevent damage to the specimens from jarring, freezing temperatures, or moisture loss.

Each cylinder shall be labeled on the side with the date, project name and number if any, cylinder I.D. number or letter, and Contractor's name. All such information shall appear on the testing laboratory's reports. Such testing laboratory reports shall be in the mail to Darren Krehbiel Consultants, LLC within 3 working days from the date of testing. Testing of concrete test cylinders taken from the concrete actually placed in the work will be paid for by the Contractor.

Three test cylinders, six inches in diameter by twelve inches in height shall be taken from a batch of concrete selected at random from each 50 cubic yards of concrete poured, but in no case shall less than one set of cylinders for each 50 cubic yards of concrete, or each day's pour be taken. One set of cylinders shall be taken from the first five cubic yards of concrete at the beginning of each day. Concrete test cylinders shall be broken as follows: one each at seven and twenty-eight days with the remaining cylinder held.

The third cylinder tested shall be as directed by Darren Krehbiel Consultants, LLC. The results of each test shall be reported to Darren Krehbiel Consultants, LLC. (ASTM C 39).

Test cylinder results shall be as follows:

7 day cylinders-75% of the specified strength, or better.

28 day cylinders-100% of the specified strength, or better.

Failure of test cylinders to meet the specified strength will result in the rejection of poured areas from which samples were taken and the Contractor will be required to remove and reconstruct any such condemned areas at his own expense. No concrete shall be placed upon other concrete poured on this project for which the 7 day test cylinder results have not been received and approval given.

Other field tests to be performed are as follows:

Test	Frequency		
Aggregate gradation	1 per 750 cubic yards*		
ASTM C 136			
Slump and air content	1 set per 50 cubic yards*		
ASTM C 143 & ASTM C 138 or ASTM C 231			
Yield	1 per 750 cubic yards*		
ASTM C 138 * or per day, whichever is the more frequent.			

If less than the frequency amount is placed in one day, tests shall be taken from the first five cubic yards.

Tests, analysis and inspections shall be made in accordance with pertinent standards of the ASTM and shall meet with the approval of Darren Krehbiel Consultants, LLC.

B. <u>Ready-mix Concrete.</u> The use of plant-mix concrete delivered to the job in revolving drum mixture trucks will be approved if evidence is submitted to establish the adequacy of the proposed concrete plant's equipment and facilities. Plant-mixed concrete shall conform to ASTM C-94. No water shall be added to the ready-mix concrete at the job site without the specific approval of Darren Krehbiel Consultants, LLC.

C. <u>Deposited Concrete</u>. Concrete shall be placed from the transporting vehicle to the place of final deposit as rapidly as practicable by methods approved by Darren Krehbiel Consultants, LLC which shall prevent the separation or loss of ingredients.

Under no circumstances shall concrete that has partially hardened be deposited in the work. Concrete shall be deposited in the forms as nearly as practicable in its final position to avoid rehandling. It shall be so deposited as to maintain, until completion of the unit, a plastic surface approximately horizontal.

D. <u>Retempering</u>. Retempering of concrete which has partially hardened will not be permitted.

E. <u>Vibrating.</u> Internal vibrators shall be used in all walls, floors, and in all reinforced work. Vibrators shall be of sturdy construction, adequately powered and capable of transmitting to the concrete not less than 3,600 impulses per minute when operating under load. A sufficient number of vibrators shall be used so that, at any rate of placement, complete vibration and compaction will be sustained throughout the entire volume of each layer of concrete. Internal vibrators shall be kept constantly moving in the concrete and shall be applied at points uniformly spaced not farther apart than the radius over which the vibrator is visibly effective. The vibrator shall not be held in one location long enough to draw a pool of laitance from the surrounding concrete.

F. <u>Curing</u>. Exposed surfaces of concrete shall be protected from premature drying caused by the hot sun, drying winds, or other causes. Freshly placed concrete shall be protected from damage from rain.

When concrete is placed while the air temperature is less than 40°F or when freezing is probable within 48 hours, all sand, aggregate, and water shall be heated, and the concrete, when being placed, shall have a

MICELLANEOUS CAST-IN-PLACE CONCRETE PROJECT NO. X1807-01

temperature of not less than 70°F nor more than 100°F. Care must be taken to prevent too rapid drying of the concrete when it is heated. During freezing weather suitable means shall be provided for maintaining the temperature of the concrete at not less than 50°F for a period of five days for normal concrete curing.

G. <u>Finishing</u>. Unless otherwise specified, exposed concrete wall surfaces shall be finished by wetting, thoroughly rubbing with a carborundum brick, and rinsing with water. Floor and wall finishes shall be finished by floating with a wood float in a manner that will thoroughly compact the concrete and will provide a smooth, even surface. Final floor finish will be attained with a steel trowel. Unexposed concrete shall have a float finish.

H. <u>Patching</u>. If, after the removal of the forms, voids, or other blemishes exist in any concrete surface, the Contractor shall remove all loose material and cut back at least one inch into solid concrete with square edges, after which he shall thoroughly moisten the surface with clean water, apply a coat of neat cement and fill the openings with grout of the same proportions as the original mix. This shall be done immediately upon removal of the forms. Tie holes, left by the withdrawal of tie rods, or holes left by the removal of ends of ties shall be filled solid with mortar.

I. <u>Construction Joints</u>. Concrete for tunnels, trenches, and walls shall be poured in units as large as possible in order to lessen the number of construction joints. The location of all joints not shown on the plans shall be approved by Darren Krehbiel Consultants, LLC. Where joints are to be made, the surface of the concrete shall be thoroughly cleaned and all latent removed. In addition to the foregoing, vertical joints shall be thoroughly wetted but not saturated, and slushed with a coat of neat cement grout immediately before the placing of new concrete.

J. <u>Openings and Recesses</u>. The Contractor shall provide all openings and recesses in the concrete as shown on the plans, or as directed by Darren Krehbiel Consultants, LLC.

K. <u>Forms and Centering</u>. Forms shall be constructed so that the finished concrete walls will conform to the shape, lines, grades and dimensions indicated on the plans. The forms shall be substantial, and sufficiently tight to prevent the leakage of mortar and shall not deflect under the weight of the wet concrete or construction loads.

Forms for exposed surfaces shall be coated with nonstaining mineral oil applied before the reinforcement is placed. After oiling, any surface oil on the reinforcing steel shall be removed. Earth trenches used for footings shall be clean, even, vertical and true. The bottoms of earth footings shall be level, clean and without fill. Where caving of the footings exists, the footings shall be formed with boards to their entire depth as shown on the plans. Forms shall not be removed until it is evident that the concrete has attained sufficient strength to carry all loads to which it shall be subjected.

L. <u>Form Ties</u>. Unless otherwise specified, form ties shall be of a design approved by Darren Krehbiel Consultants, LLC. Ties shall be such that when forms are removed no metal shall be within one inch of the finished surface. Holes remaining in the concrete after the form ties have been removed shall be filled with mortar.

## END OF SECTION 033053

# SECTION 221123.13 - BOOSTER PUMP

## PART 1 – GENERAL

#### **1.1 SUMMARY**

A. This work shall consist of the furnishing of all equipment, machinery, materials, skill, tools, and labor necessary for the installation of a complete duplex booster pump station to pump water from the existing distribution line to an existing pressure tank, as shown on the plans.

Known existing conditions are as follows:

Minimum required flow	26 gpm
Existing pressure tank range	36 psi to 56 psi
Inflow side pressure range	43.5 psi to 47.5 psi
Change in elevation (from outflow of booster pump to inflow of existing pressure tank)	162 feet
Line size and type	4-inch PVC
Ground elevation at booster station	951
Ground elevation at pressure tank	1107
Calculated TDH at 26 gpm at 56 psi in tank	294 feet

#### **PART 2 - PRODUCTS**

#### **2.1 MATERIALS**

- A. <u>Packaged System</u> Unit shall be a three phase system unless prior approval of a single phase unit is provided. Unit may be above or below ground, be self-contained or pitless, be insulated and designed for outdoor installation to withstand the elements, and include, at a minimum, control panel, heater, blower, dehumidifier, vent, pressure gauge, isolation valves, check valves, and lights; all as appropriate and necessary for the particular station supplied. Pressure gauge shall be installed on the discharge line and easily accessible.
- B. Pump and Motor Each pump shall be capable of supplying a minimum 30 gpm at a total dynamic

head of 300 feet. The pump shall be a horizontal (unless system is a pitless unit), close coupled, end suction. The pump shall be powered by 480 volt, 3 phase. Three phase electrical service is available at the site. Appurtenances shall be powered by 110 volt / 220 volt, 1 phase service as provided by a dry-type transformer.

- C. <u>Pressure Tank</u> Additional pressure tanks may be provided if a part of the pre-packaged system, however none are required. New tanks supplied as a part of this work shall be made of steel, fiberglass, or galvanized steel. The tank shall have a total volume as determined by the manufacturer for the existing conditions, be of the vertical placement type, and include standard valves, controls, and pressure relief.
- D. The booster pump system shall pump to an existing pressure tank per the physical conditions listed in the table above. The packaged booster system shall be capable of being winterized and taken out of service by Park staff without special equipment.
- E. The booster pump, individual pumps, tanks (if supplied), valves, controls, and other parts of the system shall be easily accessible to the appropriated personnel and shall otherwise be capable of being secured from unauthorized access.

# PART 3 – EXECUTION

## **3.1 CONSTRUCTION PROCEDURES**

- A. The Contractor shall provide all electrical work inside the pumping station necessary to complete all pumping and electrical controls.
- B. All electrical work, including material, shall conform and be grounded in accordance with local codes and the National Electrical Code.
- C. The Contractor shall completely check and test all electrical devices, pump controls, valves and other equipment to assure that they are in proper working order and that the entire system works together and is properly balanced. If the Contractor is unable to do this, a manufacturer's representative of the equipment will be required to adjust the new installation at no additional cost of the Owner.
- D. It shall be guaranteed that the pump, motor, controls and accessories will meet the operating conditions stated herein, and the Contractor shall make good any defect of material or workmanship developing within one year from the date of acceptance.

The control system shall be a based on a pressure switch located within, or next to, the booster station and be adjustable within the limits of system pressures for operation compatible with the existing water distribution system as modified by this project.

Booster pumps shall operate independently with one pump delivering the required pressure (flow) to the system.

#### END OF SECTION 221123.13

## SECTION 260500 – ELECTRICAL

#### PART 1 - GENERAL

## **1.1 SUMMARY**

All equipment, apparatus and systems shall be fabricated and installed in complete accordance with the latest edition or revision of the following applicable regulations, standards and codes:

ASTM	American Society for Testing Material
NEL	National Electrical Code
NEMA	National Electric Manufacturers Association
OSHA	Occupational Safety and Health Administration
UL	Underwriters Laboratories, Inc.

A. Comply with all requirements of the current edition of the National Electric Code (NFPA 70).

B. All materials and equipment shall be listed or labeled by Underwriters Laboratories (UL) or by other nationally recognized electrical testing laboratory.

#### **1.2 DEFINITION**

The work to be performed under this section of the specifications shall consist of furnishing all labor, material, and equipment necessary to provide a complete and working system in accordance with the plans and as herein specified. Specifications and plans are both to be adhered to in effecting a complete electrical installation.

## PART 2 - MATERIALS

- A. All materials and installation shall comply with the current NEC and be according to the manufacturer's recommendation.
- B. Panelboards. Panelboards shall be furnished and installed at the locations indicated on the drawings.
- C. <u>Conduits</u>. All conduits as permitted by the National Electrical Code (except those exposed to weather, run underground in contact with earth, or otherwise noted) shall be through wall electrical metallic tubing. Other conduit shall be heavy wall rigid steel. All steel conduits shall be metalized-galvanized as manufactured by General Electric, National Electric or Youngstown. Where permitted by local code, flexible steel conduit may be used for final equipment and recessed fixture connections.
- D. <u>Wiring</u>. All wire shall comply with the latest requirements of the National Electrical Code and shall be copper wire only. Conductors shall be General Electric, Anaconda, General Cable, Okonite, or National Electric. Unless otherwise indicated, the insulation of conductors shall be as follows:

Application	Type of Insulation
Service conductors	THW
Feeders and branch circuits #8 AWG and larger	THW
Branch circuits smaller than #8 AWG	TW

All branch circuits other than control wiring shall be minimum #12 wire and shall have a code rating not less than the current rating of the branch circuit over-current protection.

The Contractor shall install the service connection or entrance as directed by the local electrical utility or cooperative having jurisdiction over the work.

All conductors 600 V and smaller than 250 MCM shall be copper.

Conductor sizes #12 and #10 shall be solid, #8 and larger shall be stranded.

Non-metallic-sheathed cable (Romex) shall not be used.

# PART 3 – EXECUTION

- A. All secondary work and wiring shall be by the Contractor.
- B. All splices shall be made at outlet, pull or junction boxes. Splices or joints shall be mechanically and electrically secure and then covered with not less than two layers of polyvinyl tape. UL approved wire connectors may be used for wires No. 10 size and smaller. All controls shall be furnished by this contract and the Contractor shall make all hook-ups.
- C. The power systems shall be grounded and installed in accordance with the current National Electrical Code and Local Codes. The Contractor shall furnish and install grounding conductors from the main panels. The frame work of all boxes, panel boards, and enclosures of other electrical devices shall be electrically bonded to the grounding network to comply with the National Electrical Code and Local Codes.
- D. All work shall be properly installed in a workmanship and efficient manner and at the completion of the work the Contractor shall test the electrical system in the presence of the Owner.

## END OF SECTION 260500

#### SECTION 317119 - BORE FOR PRESSURE WATER LINE

#### PART 1 – GENERAL

#### **1.1 SUMMARY**

It is the intent of this specification to define the acceptable methods and materials for installing sanitary sewer lines by boring methods.

Contractor shall, under this bid item, furnish all machinery, labor, materials, tools and equipment as necessary to construct a road or waterway crossing by direct boring method. The finished work shall include testing, restoration of surrounding surface areas, and environmental protection.

At least 14 days prior to mobilizing equipment, Contractor shall submit detailed installation plans to Owner's Representative or Designer. The plan shall include a detailed plan and profile of the bores, plotted to scale in the horizontal and vertical. The plan shall also include a listing of major equipment, supervisory personnel, and a description of the methods to be used.

The Contractor may request changes to the proposed vertical and horizontal alignment of the installation and the location of the entry and exit points. Proposed changes shall be submitted in writing to Owner's Representative or Designer and must receive approval of Owner's Representative or Designer prior to construction.

#### **PART 2 – PRODUCTS**

#### **2.1 MATERIALS**

As specified on project plans or other applicable material sections within these specifications.

#### PART 3 – EXECUTION

All bores shall be of the steel casing type. The casing shall be of smooth wall welded steel pipe with a minimum wall thickness as shown on plans. The sewerline shall be continuously encased under the roadway and shoulder area or the entire creek bed as appropriate with the casing extended to points shown on the plans.

When PVC pipe is installed in casings, skids must be used to prevent damage to pipe and bell joints during installation and to provide proper long-term line support. PVC pipe in casings should not rest on bells. Skids should properly position the PVC pipe in the casing. Skids may either extend for the full length of pipe, with the exception of the bell and spigot portion required for assembly, or may be spaced at intervals. Skids must provide sufficient height to permit clearance between bell joint and casing wall. Skids should be fastened securely to pipe with steel strappings, cables, or clamps. The improvements shall be installed and maintained without cutting or damaging the roadway surface or shoulder area and there shall be no open excavation from ditch line to ditch line, tow of slope to tow of slope or high water mark to high water mark. All disturbed areas must be restored to a neat finished condition, acceptable to the State and Owner's Representative or Designer. All excess materials will be removed from the job site upon completion of the placement of the steel casing and pressure sewer line.

BORE FOR PRESSURE WATER LINE PROJECT NO. X1807-01

Pipes shall be stored on level ground, preferably turf or sand, free of sharp objects which could damage the pipe. Stacking of the pipe shall be limited to a height that will not cause excessive deformation of the bottom layers of pipe under anticipated temperature condition. Where necessary due to ground conditions, the pipe shall be stored on wooden sleepers, spaced suitably and of such widths as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.

Pipe shall be handled in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects. Pipe or fittings shall not be dropped onto rocky or unprepared ground. Sections of the pipes with cuts and gouges exceeding 10 percent of the pipe wall thickness shall be removed from the project.

The open ends of all sections of joined and/or installed pipe (not in service) shall be plugged at night to prevent animals or foreign material from entering the pipe line or pipe section.

Waterproof nightcaps of approved design may be used but they shall also be so constructed that they will prevent the entrance of any type of natural precipitation into the pipe and will be fastened to the pipe in such a manner that the wind cannot blow them loose.

The practice of stuffing cloth or paper in the open ends of the pipe will be considered unacceptable.

The required piping shall be assembled in a manner that does not obstruct adjacent roadways or public activities. The Contractor shall erect temporary fencing around the entry and exit pipe staging areas.

Pipe installed by the boring method must be located as shown on the drawings, and must be no shallower than shown on the drawings unless otherwise approved. The Contractor shall grant Park personnel and Owner's Representative or Designer access to the site at all times.

After the pipe is in place, cleaning pigs shall be used to remove residual water and debris. After the cleaning operation, the Contractor shall provide and run a sizing pig to check for anomalies in the form of buckles, dents, excessive out-of-roundness, and any other deformation. The sizing pig shall be considered acceptable if the survey results indicate that there are no sharp anomalies (e.g. dens, buckles, gouges, and internal obstructions) greater than 2 percent of the nominal pipe diameter, or excessive ovality greater than 5 percent of the nominal pipe diameter. For gauging purposes, dent locations are those defined above which occur within a span of 5 feet of less. Pipe ovality shall be measured as the percent difference between the maximum and minimum pipe diameters. For gauging purposes, ovality locations are those defined above which exceed a span of five feet.

Contractor shall not exceed the maximum allowable pull exerted on the pipe as stated by the manufacturer.

The pipelines shall be adequately supported during installation to prevent stressing of the pipe.

The Contractor shall at all times handle the pipe in a manner that does not over stress the pipe. Vertical and horizontal curves shall be limited so as not to exceed manufacturer's recommendations. If the pipe is damaged, the damaged section shall be removed and replaced by the Contractor at his expense.

By submitting a bid, the Contractor states he or she has visited the sites and is aware of all structures and site limitations at the crossings and has developed a boring plan with procedures to successfully allow installation and prevent operations from adversely affecting the surrounding area.

Equipment (graders, shovels, etc.) and materials (such as groundsheets, hay bales, booms, and absorbent pads) for cleanup and contingencies shall be provided in sufficient quantities by the Contractor and maintained at all sites for use in the event of inadvertent leaks, seeps or spills.

# **END OF SECTION 317119**

## SECTION 321123 - BASE-CRUSHED AGGREGATE

## PART 1 – GENERAL

## **1.1 SUMMARY**

This work shall consist of the furnishing and placing of an aggregate base on a prepared subgrade in conformity with the thickness and typical cross sections shown on the plans or as established by Owner's Representative or Designer.

#### PART 2 – PRODUCTS

#### **2.1 MATERIALS**

The aggregate shall be crushed limestone consisting of hard, durable particles or fragments of stone, free from dirt or other objectionable matter.

The crushed aggregate shall meet the requirements of the gradation given in the following table.

SIEVE	PERCENT BY WEIGHT	
SIZE	PASSING SIEVES	
$1\frac{1}{2}$ in.	100	
1 in.	70-95	
3/4 in.	55-85	
No. 4	30-60	
No. 40	10-25	
No. 200	3-10	

Type 5 MoDOT base shall also be accepted.

## PART 3 – EXECUTION

## **3.1 CONSTRUCTION PROCEDURES**

A. No base-crushed aggregate will be placed on frozen subgrade. The Contractor shall sprinkle the subgrade, if the moisture content is not acceptable, before spreading the base material.

- B. The aggregate mixture will have an even moisture content throughout for maximum compaction and will be placed with an approved spreading and finishing machine. Aggregates shall not be deposited on the pavement and bladed or dozed into place. The maximum compacted thickness of any one layer shall not exceed 3 inches. The base material shall not be allowed to segregate during the placing and compacting operations.
- C. All base-crushed aggregate compaction shall be 98% of the maximum for the material used on the project, when tested in accordance with AASHTO T-99, Method C. The moisture content of the base shall be maintained in accordance with AASHTO T-99 by wetting or drying as required.
- D. The field density of the base-crushed aggregate course after compaction will be determined in accordance with AASHTO T-191 or AASHTO T-239. The calculated density obtained in a field density test will be compared with the maximum density as established by the AASHTO T-99, Method C, to determine the percent compaction attained.
- E. The deviation of the completed surface of the aggregate base shall not exceed a maximum of  $\frac{1}{2}$  inch.
- F. The surface of the aggregate base shall be well drained at all times. It shall be the Contractor's responsibility to restore, at his expense, the earth subgrade and the aggregate base to the required grade, if at any time the compacted aggregate base or subgrade becomes unstable. The Contractor shall maintain the required density and surface condition of any portion of the completed base until either the prime or a succeeding course or pavement is placed. No prime shall be applied if the moisture in the top 2 inches of the aggregate base exceeds two-thirds of the optimum moisture as determined by the Standard Compaction Test.

#### END OF SECTION 321123

# **SECTION 321200 – ASPHALT SURFACE RESTORATION**

# PART 1 – GENERAL

## **1.1 SUMMARY**

This item shall consist of a surface course, or base course, composed of mineral aggregate and bituminous material mixed in a central mixing plant and placed on a prepared course in such proportions that the resulting mixture meets the grading requirements of the job-mix formula and in accordance with the plans and these specifications.

Each course shall be constructed to the depth, typical section or elevation required by the plans and shall be rolled, finished and approved before the placement of the next course.

## PART 2 – PRODUCTS

## **2.1 MATERIALS**

#### A. Aggregate

- 1. <u>Coarse Aggregate</u>. All coarse aggregate shall consist of crushed limestone having sound, tough, durable particles, free from adherent coatings of clay, organic matter and other deleterious substances. It shall show no more than 40% when tested in accordance with ASTM C 131. The gradation of coarse aggregate shall be such that the coarse aggregate, when combined with fine aggregate, will meet the gradation requirements for the type of asphaltic concrete specified.
- 2. <u>Fine Aggregate</u>. Fine aggregate shall consist of clean, sound, durable, angular particles produced by crushing stone, or gravel and shall be free from coatings of clay, silt or other objectionable matter and shall contain no clay balls.
- Sampling and Testing. All aggregate samples required for testing shall be furnished by the Contractor. ASTM D 75 shall be used in sampling coarse aggregate and fine aggregate, and ASTM C 183 shall be used in sampling mineral filler. No aggregate shall be used in the production of mixtures without prior written approval.
- 4. <u>Sources of Aggregate</u>. Sources of aggregate shall be selected well in advance of the time the materials are required in the work. When the source producing aggregates has a satisfactory service record in bituminous pavement construction for at least five years, samples shall be submitted 14 days prior to start of production. An inspection of the producer's operation may be made by Owner's Representative or Designer. When new sources are to be developed, the Contractor shall indicate the sources and shall submit a plan for operation 14 days in advance of starting production. Samples from test pits, borings and other excavations shall be submitted at the same time. Approval of the source of aggregate does not relieve the Contractor in any way of the responsibility for delivery at the job site of aggregates that meet the requirements specified herein.
- 5. <u>Samples of Aggregate</u>. Samples of aggregates shall be furnished by the Contractor at the start of production and at intervals during production of bituminous mixtures. The intervals and points of ASPHALT SURFACE RESTORATION PROJECT NO. X1807-01 321200 1

sampling will be designated by Owner's Representative or Designer. The samples will be the basis of approval of specific lots of aggregates from the standpoint of the quality requirements of this section.

The combined coarse and fine aggregate shall have a gradation within the limits designated as follows and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve, or vice versa, but shall be well graded from coarse to fine.

# **Base and Wearing Course Percent Passing**

Sieve Size	Base	Wearing
1 inch	100	
3/4 inch	80-100	100
1/2 inch	60-85	90-100
3/8 inch	50-75	60-90
No. 4	35-55	40-65
No. 8	25-40	25-45
No. 16	15-30	18-35
No. 30	10-20	12-25
No. 50	6-15	7-19
No. 100	4-12	4-11
No. 200	2-7	2-7

B. <u>Mineral Filler</u>. If filler, in addition to that naturally present in the aggregate, is necessary, it shall meet the requirements of ASTM D 242. Prior approval shall be required for use of fly ash as a mineral filler.

C. <u>Bituminous Material</u>. The types, grades, controlling specifications and maximum mixing temperatures for the bituminous materials are given in Table 3. Regardless of the type and grade of asphalt used, the penetration of the asphalt cement shall not to be less than 60 nor more than 100 without written approval from Owner's Representative or Designer.

The Contractor shall furnish vendor's certified test reports for each carload or equivalent of bitumen shipped to the project. The report shall be delivered to Owner's Representative or Designer before permission is granted for use of the material. The vendor's certified test report for the bituminous material can be used as a basis for final acceptance; however, Owner's Representative or Designer reserves the right to have the material tested and reject it if the asphalt cement does not meet the specifications.

#### TABLE 3

## **BITUMINOUS MATERIAL**

TYPE AND GRADE			TEMPERATU	<u>RE</u>
ASPHALT CEMENT		<b>SPECIFICATION</b>	F	С
Penetration Grade	60-70	ASTM D 946	335	170
	85-100		325	165
Viscosity Grade	AC-10	ASTM D 3381	315	155
	AC-20		330	165
Viscosity Grade	AR-4000	ASTM D 3381	325	165
	AR-8000		325	165
Tar	RT-11x	ASTM D 490	250	125
	RT-12		250	125

#### D. Composition

1. <u>Composition of Mixture</u>. The bituminous plant mix shall be composed of a mixture of aggregate, filler, if required, and bituminous material. The aggregate fractions shall be sized, uniformly graded and combined in such proportions that the resulting mixture meets the grading requirements of the job mix formula.

2. <u>Job Mix Formula</u>. No bituminous mixture shall be produced for payment until a job mix formula has been approved by Owner's Representative or Designer. The samples shall be taken from the source by the Contractor and delivered to the testing laboratory at the Contractor's expense. The samples of materials shall be of the size specified by Owner's Representative or Designer. The Contractor's testing laboratory shall prepare the job mix formula. If the first job mix formula does not meet the requirements of these specifications or the Contractor should decide to change sources of material, the Contractor shall pay for additional job mix formulas.

# TABLE 4 MARSHALL DESIGN CRITERIA BASE COURSE

Test Property	Pavement	
No. of Blows	50	
Marshall Stability	1000 (Pound	ls)
Flow (0.01 in.)	8-20	
Voids	*Non Absorptive	**Absorptive
Criteria	Aggregate	Aggregate
% Air Voids	3-6	3-8
% Voids Filled		
With Asphalt	65-85	70-90

\* When absorption of blended aggregate is less than 2.5%, use the apparent specific gravity determined in accordance with ASTM C 127 for coarse aggregate and ASTM C 128 for fine aggregate.

\*\* When the absorption of the blended aggregates equals or exceeds 2.5%, the bulk impregnated specific gravity shall be used.

# PART 3 – EXECUTION

A. <u>Weather Limitations</u>. The bituminous mixture shall not be placed: upon a wet surface; when the surface temperature of the underlying course is less than 50°F; when weather conditions prevent the proper handling or finishing of the mixture; or between October 1 and April 1 without written approval of Owner's Representative or Designer.

B. <u>Application of Prime</u>. The prime shall be either RC-70/MC-70/SC-70 conforming to AASHTO M81/M82/M141 and applied at a temperature between 120°F and 160°F or RC-250/MC-250/SC-250 conforming to AASHTO M81/M82/M141 and applied at a temperature between 160°F and 200°F. Prime coat shall be applied only when the air temperature or surface temperature is above 60°F, the existing surface is dry, and the weather is neither rainy nor foggy. Prime coat shall be applied at a rate between 0.2 and 0.5 gallon per square yard as determined by Owner's Representative or Designer.

C. <u>Preparation of Bituminous Material</u>. The bituminous material shall be heated to the specified temperature in a manner that will avoid local overheating and provide a continuous supply of the bituminous material to the mixer at a uniform temperature. The temperature of the bituminous material delivered to the mixer shall be sufficient to provide a suitable viscosity for adequate coating of the aggregate particles but shall not exceed the application maximum temperature set forth in Table 3.

D. <u>Preparation of Mineral Aggregate</u>. The aggregate for the mixture shall be dried and heated to the temperature designated by the job formula within the job tolerance specified. The maximum temperature and rate of heating shall be such that no permanent damage occurs to the aggregates. Particular care shall be taken that aggregates high in calcium or magnesium content are not damaged by overheating. The temperature shall not be lower than is required to obtain complete coating and uniform distribution on the aggregate particles and to provide a mixture of satisfactory workability. The aggregate shall not be heated greater than 25° F above the temperature of the bituminous material.

E. <u>Preparation of Bituminous Mixture</u>. The aggregates and the bituminous material shall be measured or gauged and introduced into the mixer in the amount specified by the job mix formula.

The combined materials shall be mixed until complete and uniform coating of the particles and a thorough distribution of the bituminous material throughout the aggregate are secured. Wet mixing time shall be approved by Owner's Representative or Designer for each plant and for each type aggregate used. Normally, the mixing time after introduction of bituminous material should be less than 30 seconds. For continuous mix plants, the minimum mixing time shall be determined by dividing the weight of its contents at operating level by the weight of the mixture delivered per second by the mixer.

Pugmill dead capacity in pounds

\_\_\_\_\_

= Pugmill output in pounds per second

Mixing time (seconds)

The dry mixing time in the batch plant shall be the time required to blend the dry aggregate in a uniform mixture. The wet mixing time begins with the introduction of the asphalt cement to the pugmill and ends with the opening of the discharge gate.

Prolonged exposure to air and heat in the pugmill hardens the asphalt film on the aggregate through oxidation; therefore, the mixing time should be the shortest time required to obtain uniform distribution of aggregate sizes and thorough coating of aggregate particles with the bituminous material.

F. <u>Transporting, Spreading, and Finishing.</u> The mixture shall be transported from the mixing plant to the point of use in vehicles conforming to the following requirements. Trucks used for hauling bituminous mixture shall have tight, clean, smooth, metal beds which have been thinly coated with a minimum quantity of lime solution, or other approved material to prevent the mixture from adhering to the beds. Use of diesel fuel, fuel oil or other detrimental products as a bed coating will not be allowed. Each truck shall have a securely fastened cover of canvas or other suitable material of such size as to protect the mixture from the weather. When necessary, so that the mixture will be delivered on the road at the specified temperature, truck beds shall be insulated. Deliveries shall be scheduled so that spreading and rolling of all mixtures prepared for one day's run can be completed during daylight, unless adequate artificial lighting is provided. Hauling over freshly placed material shall not be permitted until the material has been compacted, as specified, and allowed to cool to ambient temperature or 6 hours, whichever is longest.

Immediately before placing the bituminous mixture, the underlying course shall be cleared of all loose or deleterious material with power blowers, power brooms or hand brooms, as directed.

The mix shall be placed at a temperature of not less than  $250^{\circ}$ F when asphalt cement is used and not less than  $150^{\circ}$ F when tar is used. Moisture content of the mix shall not exceed 0.5%.

The intermediate lifts may be laid in thickness up to two inches provided graded control can be maintained, and no roller marks or signs of asphalt flushing can be noted in the finished product. The thickness of the final lift shall not be more than two inches nor less than twice the size of the maximum size aggregate in the mix. ASPHALT SURFACE RESTORATION PROJECT NO. X1807-01 321200 - 5 Upon arrival, the mixture shall be spread to the full width by an approved bituminous paver. It shall be structured off in a uniform layer of such depth that, when the work is completed, it shall have the required thickness and shall conform to the grade and contour indicated. The speed of the paver shall be regulated to eliminate pulling and tearing of the bituminous mat.

For pavements having a width of 16 to 24 feet, inclusive, the asphaltic concrete pavement shall be laid in lanes approximately one half the full width completed as soon as practicable. Unless otherwise permitted, a single lane of any course shall not be constructed to a length which cannot be completed to full width of the pavement the succeeding operating day. For pavements greater than 24 feet wide, single lane width construction shall be limited to one day's production and completion to full width shall be accomplished as soon as practicable.

No segregation will be permitted in handling the mixture at the plant, from the truck, or during spreading operations on the roadbed. All layers shall be feathered out, by hand raking if necessary, in transitioning the depth of the surface to meet present grades at ends of projects, to provide a uniform, smooth riding surface free of irregularities. Where only the top layer of the surfacing continues across any concrete surfacing, the bottom layers shall be feathered out.

When multilayer asphaltic concrete pavement or an asphaltic concrete surface is being constructed on a base course, the stringline method shall be used. The Contractor shall set grade stakes and stringlines for each paving lane. If multilifts of asphaltic concrete are being laid and Owner's Representative or Designer and the Contractor are satisfied that the grades and surface tolerances on the final lift can be met, then long sled and joint matches can be used.

When stringlines are required, they shall consist of piano wire or other approved material. The stringlines shall be supported at a maximum of 25 foot centers. Additional supports shall be installed to prevent sag, if required. The horizontal alignment of the stringlines shall be within <sup>1</sup>/<sub>4</sub>" inch per 10 feet. The Contractor shall provide a satisfactory method of securing the stringline where vertical curves are constructed to maintain the proper grade.

After the first lane of each lift is constructed, the joint matcher (short ski) shall be used on the previously laid lane. The free edge shall be controlled as specified herein before. The automatic transverse grade control device shall be used only when one paving lane on each side of the high point of the pavement is to be constructed. Example: One lane pavement or two lane crowned pavement.

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the mixture may be spread, raked and luted by hand tools.

G. <u>Compaction of Mixture</u>. After spreading, the mixture shall be thoroughly and uniformly compacted with power rollers. Rolling of the mixture shall be discontinued if undue displacement or cracking occurs. Rolling shall be initiated with the drive wheel toward the paving machine. The sequence of rolling for the first paving lane should be to first roll the sides and proceed longitudinally parallel to the road centerline, each trip overlapping one half the roller width, gradually progressing to the crown of the road. When abutting a previously placed lane, the longitudinal joint shall be rolled first followed by the regular rolling procedure. Alternate paths of the roller shall be of slightly different lengths. The rolling pattern may be varied to obtain proper compaction at the direction of Owner's Representative or Designer.

The speed of the roller shall, at times, be sufficiently slow to avoid displacement of the hot mixture. The rollers shall not travel faster than the manufacturer's recommended speed and in no case faster than 3 mph. Any displacement occurring as a result of reversing the direction of the roller, or from any other cause, shall be corrected at once by rakes and fresh mixture. The roller shall not be permitted to stand static on the hot material. ASPHALT SURFACE RESTORATION PROJECT NO. X1807-01 321200 - 6

Sufficient rollers shall be furnished to handle the output of the plant. Rolling shall continue until all roller marks are eliminated, the surface is of uniform texture and true to grade and cross section, and the required field density is obtained.

To prevent adhesion of the mixture to the roller, the wheels shall be kept properly moistened, but excessive water will not be permitted.

In areas not accessible to the roller, the mixture shall be thoroughly compacted with hot hand tampers.

Any mixture which becomes loose and broken, mixed with dirt or in any way defective shall be removed and placed with fresh, hot mixture and immediately compacted to conform to the surrounding area. This work shall be done at the Contractor's expense. Skin patching shall not be allowed.

H. <u>Joints</u>. The construction of all joints shall be made in such a manner as to ensure a continuous bond between old and new sections of the course. All joints shall present the same texture, density and smoothness as other sections of the course. All contact surfaces of previously constructed pavements that have become coated by dust, sand or other objectionable material shall be cleaned by brushing or shall be cut back with an approved power saw, as directed. The faces of these joints may be painted with a thin coating of tack coat material.

When necessary to form a transverse joint, it shall be made by means of placing a bulkhead or by tapering the course, in which case the edge shall be cut back to its full depth and width on a straight line to expose a vertical face. When paving in that lane is continued, the joint shall be heated with the paver screed until the material along the joint is soft. Overheating of the material shall not be permitted. The joint shall be rolled perpendicular to the paving lane with the roller overlapping the new material approximately one foot. Boards or other devices shall be placed on the edge or edges of the paving lane to prevent roll down of the edges.

Longitudinal construction joints shall be constructed so that the surface is one continuous plane and will not pond water. The longitudinal joint shall be horizontally compacted with an asphalt lute until the surface of the joint is slightly higher than the remainder of the mat immediately after breakdown rolling operations have been completed. After this has been completed, rolling operations shall continue.

If a good longitudinal construction joint cannot be obtained or the desired compaction reached, the joint shall be heated as specified hereinafter. This includes joints that existed prior to the new project or joints created from the previous day's production.

I. <u>Shaping Edges</u>. While the surface is being compacted and finished, the Contractor shall carefully trim the outside edges of the pavement to 45 degrees. Edges so formed shall be beveled, while still hot, with the back of a rake or a smooth iron and thoroughly compacted by tampers or by other satisfactory methods.

J. <u>Acceptance Sampling and Testing of Bituminous Mixture (Compaction).</u> Pavement density will be determined by taking the average density of four laboratory-prepared specimens, taken from trucks delivering mixture to the site. Temperature of the mixture immediately prior to compaction shall be  $250^{\circ}F \pm 5$ . The sample of mixture can be placed in an oven for not more than 30 minutes to maintain the heat, but it shall not be reheated if it cools before use. Density samples shall not be taken in the pavement where the pavement thickness is less than 12 times the mixture aggregate size. This applies only to wedge courses and tapered transitions.

The average field density shall be equal to or greater than 98% of the average density of the laboratory-prepared specimens. Cores taken from the pavement will be used to test the field density. The density of the laboratory-prepared specimens and the cored samples will be determined in accordance with ASTM D 2726 or D 1188,

whichever is applicable. The direct transmission nuclear method of test and/or the backscatter nuclear method of test may be used to determine field density.

The Contractor shall cut samples from any layer of the compacted mixture at locations designated by Owner's Representative or Designer and shall deliver to the field laboratory in good condition. Samples may be obtained by either sawing with a power saw or by drilling 4-inch diameter cores.

Tests for conformity with the specified crown and grade shall be made by the Contractor immediately after initial compaction. Any variation shall be corrected by the removal or addition of materials and by continuous rolling.

Unless otherwise specified in writing, the Contractor shall provide a 10-foot straight edge on the job at all times.

After completion of final rolling, the smoothness of the course shall again be tested; humps or depressions exceeding the specified tolerances shall be immediately corrected. The finished surface shall not vary more than 1/8 inch for the surface course when tested with a 10-foot straight edge applied parallel with and/or at right angles to the centerline. The Contractor shall correct pavement areas not meeting these tolerances in excess of this amount by removing and replacing the defective work. If the Contractor elects to construct an overlay to correct the deficiencies, the minimum thickness of the overlay shall not be less than twice the size of maximum size aggregate.

## END OF SECTION 321200

# SECTION 331116.11 - TRACER WIRE

#### PART 1 – GENERAL

#### **1.1 SUMMARY**

This work shall consist of the furnishing of all equipment, materials, skill, tools, and labor necessary for the installation of tracer wire for all lines completed as a part of this work.

#### **1.2 GENERAL**

All tracer wire shall have HDPE insulation intended for direct bury, color coated per American Public Works Association (APWA) standard for the specific utility being marked.

#### **PART 2 – PRODUCTS**

#### **2.1 TRACER WIRE**

- A. Open Trench Tracer wire shall be #12 AWG Copper Clad Steel, High Strength with minimum 450 lb. break load, with minimum 30 mil HDPE insulation thickness.
- B. Directional Drilling/Boring Tracer wire shall be #12 AWG Copper Clad Steel, Extra High Strength with minimum 1,150 lb. break load, with minimum 30 mil HDPE insulation thickness.
- C. Tracer wire Pipe Bursting/Slip Lining Tracer wire shall be 7 x 7 Stranded Copper Clad Steel, Extreme Strength with 4,700 lb. break load, with minimum 50 ml HDPE insulation thickness.

#### **2.2 CONNECTORS**

- A. All mainline tracer wires must be interconnected in intersections, at mainline tees and mainline crosses. At tees, the three wires shall be joined using a single 3-way lockable connector. At Crosses, the four wires shall be joined using a 4-way connector. Use of two 3-way connectors with a short jumper wire between them is an acceptable alternative.
- B. Direct bury wire connectors shall include 3-way lockable connectors and mainline to lateral lug connectors specifically manufactured for use in underground tracer wire installation. Connectors shall be dielectric silicon filled to seal out moisture and corrosion, and shall be installed in a manner so as to prevent any uninsulated wire exposure.
- C. Non locking friction fit, twist on or taped connectors are prohibited.

#### **PART 3 – EXECUTION**

#### **3.1 TERMINATION/ACCESS**

- A. All tracer wire termination points must utilize an approved tracer wire access box (above ground access box or grade level/in-ground access box as applicable), specifically manufactured for this purpose.
- B. All grade level/in-ground access boxes shall be appropriately identified with "sewer" or "water" cast into the cap and be color coded.
- C. A minimum of 2 ft. of excess/slack wire is required in all tracer wire access boxes after meeting final elevation.
- D. All tracer wire access boxes must include a manually interruptible conductive/connective link between the terminal(s) for the tracer wire connection and the terminal for the grounding anode wire connection.
- E. Grounding anode wire shall be connected to the identified (or bottom) terminal on all access boxes.

## **3.2 HYDRANTS**

A. Tracer wire must terminate at an approved above-ground tracer wire access box, properly affixed to the hydrant grade flange. (affixing with tape or plastic ties shall not be acceptable)

#### 3.3 LONG RUNS

A. Long-runs, in excess of 500 linear feet without service laterals or hydrants must be provided utilizing an approved grade level/in-ground tracer wire access box, located at the edge of the road right-of-way, and out of the roadway. The grade level/in-ground tracer wire access box shall be delineated using a minimum 48" polyethylene marker post, color coded per APWA standard for the specific utility being marked.

#### **3.4 GROUNDING**

- A. Tracer wire must be properly grounded at all dead ends/stubs.
- B. Grounding of tracer wire shall be achieved by use of a drive-in magnesium grounding anode rod with a minimum of 20ft of #12 red HDPE insulated copper clad steel wire connected to anode (minimum 1.5 lb.) specifically manufactured for this purpose, and buried at the same elevation as the utility.
- C. When grounding the tracer wire at dead ends/stubs, the grounding anode shall be installed in a direction 180 degrees opposite of the tracer wire, at the maximum possible distance.
- D. When grounding the tracer wire in areas where the tracer wire is continuous and neither the mainline tracer wire or the grounding anode wire will be terminated at/above grade, install grounding anode directly beneath and in-line with the tracer wire. Do not coil excess wire from grounding anode. In this installation method, the grounding anode wire shall be trimmed to an appropriate length before connecting to tracer wire with a mainline to lateral lug connector.

E. Where the anode wire will be connected to a tracer wire access box, a minimum of 2 ft. of excess/slack wire is required after meeting final elevation.

# **3.5 GENERAL**

- A. Tracer wire installation shall be performed in such a manner that allows proper access for connection of line tracing equipment, proper locating of wire without loss or deterioration of low frequency (512Hz) signal for distances in excess of 1,000 linear feet, and without distortion of signal caused by multiple wires being installed in close proximity to one another.
- B. Tracer wire systems must be installed as a single continuous wire, except where using approved connectors. No looping or coiling of wire is allowed.
- C. Any damage occurring during installation of the tracer wire must be immediately repaired by removing the damaged wire, and installing a new section of wire with approved connectors. Taping and/or spray coating shall not be allowed.
- D. Tracer wire shall be installed at the bottom half of the pipe and secured (taped/tied) at 5' intervals.
- E. Tracer wire must be properly grounded as specified.
- F. Tracer wire on all service laterals/stubs must terminate at an approved tracer wire access box located directly above the utility, at the edge of the road right-of-way, but out of the roadway. (See Tracer wire Termination/Access)
- G. At all mainline dead-ends, tracer wire shall go to ground using an approved connection to a drive-in magnesium grounding anode rod, buried at the same depth as the tracer wire. (See Grounding)
- H. Mainline tracer wire shall not be connected to existing conductive pipes. Treat as a mainline dead- end, ground using an approved waterproof connection to a grounding anode buried at the same depth as the tracer wire.
- I. All service lateral tracer wires shall be a single wire, connected to the mainline tracer wire using a mainline to lateral lug connector, installed without cutting/splicing the mainline tracer wire.
- J. In occurrences where an existing tracer wire is encountered on an existing utility that is being extended or tied into, the new tracer wire and existing tracer wire shall be connected using approved splice connectors, and shall be properly grounded at the splice location as specified.
- K. A mainline tracer wire must be installed, with all service lateral tracer wires properly connected to the mainline tracer wire, to ensure full tracing/locating capabilities from a single connection point.
- L. Lay mainline tracer wire continuously, by-passing around the outside of valves and fittings on the North or East side.
- M. Tracer wire on all water service laterals must terminate at an approved tracer wire access box color coded blue and located directly above the service lateral at the edge of road right of way.

- N. Above-ground tracer wire access boxes will be installed on all fire hydrants.
- O. All conductive and non-conductive service lines shall include tracer wire.

#### **3.6 PROHIBITED PRODUCTS AND METHODS**

#### The following products and methods shall not be allowed or acceptable:

- A. Uninsulated tracer wire
- B. Tracer wire insulations other than HDPE
- C. Tracer wires not domestically manufactured
- D. Non locking, friction fit, twist on or taped connectors
- E. Brass or copper ground rods
- F. Wire connections utilizing taping or spray-on waterproofing
- G. Looped wire or continuous wire installations, that has multiple wires laid side-by-side or in close proximity to one another
- H. Tracer wire wrapped around the corresponding utility
- I. Brass fittings with tracer wire connection lugs
- J. Wire terminations within the roadway, i.e. in valve boxes, cleanouts, manholes, etc.
- K. Connecting tracer wire to existing conductive utilities

#### **3.7 TESTING**

- A. All new tracer wire installations shall be located using typical low frequency (512Hz) line tracing equipment, witnessed by the contractor, engineer and facility owner as applicable, prior to acceptance of ownership.
- B. This verification shall be performed upon completion of rough grading and again prior to final acceptance of the project.
- C. Continuity testing in lieu of actual line tracing shall not be accepted.

#### **END OF SECTION 331116.11**
#### 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: Address:	OA-Facilities Mgmt, Design, and Construc 301 West High Street, Hst Rm 370	
	Jefferson City, MO 65101	
Continuing Authority:	OA Facilities Mgmt Design Construction 301 West High St.	
	Hst 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 681, Cole County	
UTM Coordinates:	571840.000/4270368.000	
Receiving Stream:	Various State Wide (U)	
First Classified Stream - ID#:	Missouri R. (P) 701.00	
USGS# and Sub Watershed#:	10300102 - 1305	

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)

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

July 01, 2017

Wined B. Gallinth

Issue Date

Edward B. Galbraith, Director Division of Environmental Quality

Fired & Cambo

June 22, 2022 **Expiration** Date

David J. Lamb, Acting Director Water Protection Program

#### APPLICABILITY

- This general 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. This general permit also authorizes the discharge of stormwater and certain non-stormwater discharges from smaller projects where the Missouri Department of Natural Resources (department) has exercised its discretion to require a permit [10 CSR 20-6.200(1)(B)].
- 2. This general permit is issued to a city, county, state or federal agency or other governmental jurisdiction for land disturbance projects performed by or under contract to the permittee.
- 3. A general stormwater control plan or stormwater pollution prevention plan (SWPPP) must be developed prior to issuance of this permit. These plans must include a narrative of the types and appropriate uses of Best Management Practices (BMPs) for erosion and sediment control and stormwater management. All water pollution controls on land disturbance sites shall conform to the storm water control program and/or SWPPP of the city, county or other governmental jurisdiction in which the land disturbance activity is occurring. The requirements of the stormwater control program and/or SWPPP must be at least as stringent as those described in this permit and 10 CSR 20-6.200.
- 4. 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 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 legal owner of the property, right-of-way or the holder of an easement on the property, and operator on which the site is located are responsible for compliance with this permit.
- 5. This permit authorizes discharges from construction support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas) provided that appropriate stormwater controls are designed, installed, maintained and provided:
  - 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; and
  - c. The support activity does not continue to operate beyond the completion of the construction activity at the project it supports.

The permittee is responsible for compliance with this permit for any construction support activities.

- 6. This permit authorizes non-stormwater discharges from the following activities provided that these discharges are addressed in the permittee's specific SWPPP required by this general permit:
  - a. Dewatering activities if there are no contaminants other than sediment present in the discharge, and the discharge is treated as specified in Requirements, Section 10.0. of this permit;
  - b. Flushing water hydrants and potable water lines;
  - c. Water only (i.e., without detergents or additives) rinsing of streets and buildings; and
  - d. Site watering to establish vegetation.
- 7. This general permit does not authorize the:
  - a. placement of fill materials in waters or floodplains
  - b. obstruction of stream flow,
  - c. redirection of stormwater across private property not owned or operated by the permittee, or

d. Changing the channel of a defined drainage course.

These actions may be regulated by other federal, state, or local entities, such as the U.S. Army Corps of Engineers or Federal Emergency Management Agency. This general permit addresses only the quality of the stormwater runoff and the minimization of off-site migration of sediments and other water contaminants.

- 8. This permit does not authorize land disturbance activity in jurisdictional waters of the United States, unless the permittee has obtained the required Clean Water Act Section 404 Department of the Army permit from the U.S. Army Corps of Engineers and its associated Section 401 Water Quality Certification from the department. Land disturbance activities may not begin in the affected waters of the United States until the required §404 permit and §401 water quality certification have been obtained.
- 9. This general permit prohibits any discharge of wastewater generated from air pollution control equipment or the containment of scrubber water in lined ponds to waters of the state.
- 10. This general permit prohibits any discharge of sewage or pollutants to waters of the state including but not limited to:
  - a. Any hazardous material, oil, lubricant, solid waste or other non-naturally occurring substance from the site, including fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;
  - b. Soaps or solvents used in vehicle and equipment washing;
  - c. Hazardous substances or petroleum products from an on-site spill or handling and disposal practices;
  - d. Wash and/or rinse waters from concrete mixing equipment including ready mix concrete trucks, unless managed by an appropriate control. Any such pollutants must be adequately treated and addressed in the SWPPP, and cannot be discharged to waters of the state;
  - e. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;
  - f. Domestic wastewaters, including gray waters; or
  - g. Industrial stormwater runoff.
- 11. The department reserves the right to revoke or deny coverage under this general permit to applicants for stormwater discharges from land disturbance activities at sites that have contaminated soils that will be disturbed by the land disturbance activity or where such materials are brought to the site to use as fill or borrow. A site-specific permit may be required to cover such activities.
- 12. If at any time the department determines that the quality of waters of the state may be better protected by requiring the owner/operator of the permitted site to apply for a site-specific or different general permit, the department may do so [10 CSR 20-6.010(13)(C)]. Examples of when this may occur:
  - a. The permittee is not in compliance with the conditions of this general permit;
  - b. The discharge no longer qualifies for this general permit due to changed site conditions and/or regulations; or
  - c. Information becomes available that indicates water quality standards have been or may be violated.

The permittee will be notified in writing of the requirement to apply for a site-specific permit or a different general permit. When issued to the authorized permittee, the applicability of this general permit to the permittee is automatically terminated upon the effective date of the site-specific or different general permit.

13. Any owner/operator authorized by a general permit may request to be excluded from the coverage of the general permit and apply for a site-specific permit [10 CSR 20-6.010(13)(D)].

- 14. 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; or the Resource Conservation and Recovery Act. Determination of applicability for the above mentioned acts is the responsibility of the permittee.
- 15. This permit does not supersede any requirement for obtaining project approval under an established local authority.
- 16. This permit is not transferable to other owners or operators.

### EXEMPTIONS FROM PERMIT REQUIREMENTS

- 1. Facilities that discharge all stormwater runoff directly to a combined sewer system are exempt from stormwater permit requirements.
- 2. Land disturbance activity as described in 10 CSR 20-6.010(1)(B) and 10 CSR 20-6.200(1)(B).
- 3. Oil and gas related activities as listed in 40 CFR 122.26(a)(2)(ii).

#### REQUIREMENTS

1. Electronic Discharge Monitoring Report (eDMR) Submission System.

Per 40 CFR Part 127 National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, reporting shall be submitted by the permittee via an electronic system to ensure timely, complete, accurate, and nationally-consistent set of data about the NPDES program. All general permit covered facilities under this master general permit shall comply with the department's requirements for electronic reporting.

- a. Reporting Requirements.
  - (1) Application to participate in the department's eDMR system is required as part of the application for general permit coverage in order to constitute a complete permit application and may be accessed at <u>dnr.mo.gov/env/wpp/edmr.htm</u>.
  - (2) The permittee must electronically submit quarterly reports via the eDMR system.
- b. Other actions. The following shall be submitted electronically after such a system has been made available by the department:
  - (1) General Permit Applications/Notices of Intent to discharge (NOIs);
  - (2) Notices of Termination (NOTs);
  - (3) No Exposure Certifications (NOEs); and
  - (4) Low Erosivity Waivers and Other Waivers from Stormwater Controls (LEWs).
- c. Electronic Submissions. To access the eDMR system, use the following web link: <u>https://edmr.dnr.mo.gov/edmr/E2/Shared/Pages/Main/Login.aspx</u>.
- d. Waivers from Electronic Reporting.
  - (1) The permittee must electronically submit reports unless a waiver is granted by the department in compliance with 40 CFR Part 127.
  - (2) The permittee may obtain a temporary or permanent electronic reporting waiver by first submitting an eDMR Waiver Request Form (Form 780-2692: <u>http://dnr.mo.gov/forms/780-2692-f.pdf</u>, by contacting the appropriate permitting office or emailing <u>edmr@dnr.mo.gov</u>). The department will either approve or deny this electronic reporting waiver request within 120 calendar days of receipt.
  - (3) Only permittees with an approved waiver request may submit reports on paper to the Department for the period that the approved electronic reporting waiver is effective.
- 2. <u>Quarterly Reports</u>: 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;
- 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 to the department quarterly via the department's eDMR system. When a permittee terminates permit coverage, the permittee shall submit with the request for termination, the final quarterly report for the current calendar quarter. The permittee shall submit quarterly reports according to Table A.

Table A	Schedule for Quarterly Reporting	
Activity for	or 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 28
October, November, December (4th Quarter)		January 28

- 3. This permit is to ensure the design, installation and maintenance of effective erosion and sediment controls minimize the discharge of pollutants by:
  - a. Controlling stormwater volume and velocity within the site to minimize soil erosion;
  - b. Controlling 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 in the immediate vicinity of discharge points;
  - c. Minimizing the amount of soil exposed during construction activity;
  - d. Minimizing the disturbance of steep slopes;
  - e. Addressing factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle size expected to be present on the site to minimize sediment discharges from the site;
  - f. Providing and maintaining natural buffers around surface waters as detailed in 10.f.
  - g. Directing stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration and filtering, unless infeasible; and
  - h. Minimizing soil compaction and, unless infeasible, preserve topsoil. Minimizing soil compaction or preserving topsoil is not required where the intended function of a specific area of the site dictates that it be compacted or the topsoil be disturbed or removed.
- 4. Installation of Best Management Practices (BMPs) necessary to prevent soil erosion at the project boundary must be complete prior to the start of all phases of construction.
- 5. Install sediment controls along any perimeter areas of the site..
  - a. Remove any sediment per the manufacturer's instructions or before it has accumulated to one-half of the above-ground height of any perimeter control.
  - b. For sites where perimeter controls are infeasible, other practices shall be implemented to minimize discharges to perimeter areas of the site.
- 6. BMPs shall be maintained and remain in effective operating condition during the entire duration of the project, with repairs made within the timeframe specified in the Requirements Section 9of this permit, until final stabilization has been achieved.
- 7. Minimize sediment track-out from the site.
  - a. Restrict vehicle traffic to properly designed exit points such as an aggregate stone with an underlying geotextile or non-woven filter fabric.

- b. Use appropriate stabilization techniques at all points that exit onto paved roads.
- c. Remove any sediment that has been tracked out within the same business day or by the end of the next business day if track-out occurs on a non-business day.
- 8. <u>SWPPP Development and Implementation</u>: 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. The permittee shall fully implement the provisions of the SWPPP required under this part as a condition of this general permit throughout the term of the land disturbance project. The SWPPP must be developed prior to issuance of the permit and must be updated with details specific to the land disturbance site prior to conducting any land disturbance activities at the site. Either an electronic copy or a paper copy of the SWPPP must be accessible to anyone on-site at all times when land disturbance or integrity of the BMP structures and made available as specified under the Records Section of this permit.
- 9. The SWPPP must:
  - a. List and describe all points of discharge to receiving water(s);
  - b. Incorporate required practices identified below;
  - c. Incorporate erosion control practices specific to site conditions;
  - d. Provide for maintenance and adherence to the plan;
  - e. Discuss whether or not additional authorizations, such as a Section 404 permit and associated Section 401 Water Quality Certification are required for the project; and
  - f. Name the person responsible for inspection, operation and maintenance of BMPs.

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; compliance with the Missouri Water Quality Standards; and compliance with the terms and conditions of this general permit.

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/npdes/developing-stormwater-pollution-prevention-plan-swppp; and 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 is available on the department's internet site at <u>http://www.dnr.mo.gov/env/wpp/wpcp-guide.htm</u>.

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 should be described and justified in the SWPPP.

- 10. <u>SWPPP Requirements</u>: The following information and practices shall be provided for in the SWPPP:
  - a. <u>Nature of the Construction Activity</u>: The SWPPP briefly must describe the nature of the construction activity, including:
    - (1) The function of the project (e.g., low density residential, shopping mall, highway, etc.);
    - (2) The intended sequence and timing of activities that disturb the soils at the site;
    - (3) Estimates of the total area expected to be disturbed by excavation, grading, or other construction activities including off-site borrow and fill areas; and
    - (4) A general map (e.g., United States Geological Survey quadrangle map, a portion of a city or county map, or other map) with enough detail to identify the location of the construction site and waters of the state within one mile of the site.

- b. <u>Site Map</u>: The SWPPP must contain a legible site map showing the site boundaries and points of discharge to receiving water(s) and identifying:
  - (1) Direction(s) of stormwater flow and approximate slopes for all phases of construction activities;
  - (2) 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);
  - (3) Location of permanent and temporary structural and non-structural BMPs identified in the SWPPP;
  - (4) Locations where stabilization practices are expected to occur;
  - (5) Locations of off-site material, waste, borrow or equipment storage areas;
  - (6) Locations of all waters of the state (including wetlands);
  - (7) Locations where stormwater discharges to a surface water; and
  - (8) Areas where final stabilization has been accomplished and no further construction-phase permit requirements apply.
- c. <u>Site Description</u>: In order to identify the site, the SWPPP shall include facility and points of discharge to receiving water(s) information. 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.
- d. <u>Selection of Temporary and Permanent BMPs</u>: The permittee shall select, install, use, operate and maintain appropriate BMPs for the permitted site and list them in the SWPPP.
- e. <u>Preservation of trees and vegetation</u>: The SWPPP shall require existing vegetation and trees to be preserved where practical.
- f. <u>Surface Water Buffers</u>: For surface waters of the state, defined 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, located on or adjacent to the site," the permittee must comply with (1)-(3), except as noted in (4):
  - (1) Provide and maintain a 50-foot undisturbed natural buffer;
  - (2) 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
  - (3) 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.
  - (4) The permittee is not required to comply with (1), (2) or (3) above if one of the following exceptions apply and documentation is provided in the SWPPP:
    - (a) As authorized per Clean Water Act Section 404 Department of the Army permit and its associated Section 401 Water Quality Certification from the department.
      - 1. The angle of any crossing shall be as perpendicular as feasible to the water course or natural stream buffer to minimize adverse impacts.
    - (b) 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 your site. This includes situations where you have implemented permanent control measures that will prevent such discharges, such as a berm or other barrier.
    - (c) 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.
      - 1. 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, you are required to comply with (1), (2), or (3) above.
    - (d) For linear projects where site constraints make it infeasible to implement a buffer or equivalent provided you limit disturbances within 50 feet of any waters of the state and/or you provide supplemental erosion and sediment controls to treat stormwater

discharges from earth disturbances within 50 feet of the water of state.

- (e) For small residential lot construction as defined as 'a lot being developed for residential purposes that will disturb less than 1 acre of land, but is part a larger common plan of development or sale,' one has the option of complying with (1), (2) or (3) above or one of the following alternatives:
  - 1. Tiered-technology approach where:
    - a. A 50-foot or larger buffer is retained, no additional requirements are needed,
    - b. The buffer is greater than 30 feet but less than 50 feet wide, implement double perimeter controls spaced a minimum of at least 5 feet apart between land disturbance and water of the state, or
    - c. A less than or equal to 30-foot buffer is maintained, implement double perimeter controls between land disturbance and water of the state and stabilization activities completed with 7 calendar days of temporary or permanent cessation of land disturbance; or
  - 2. Sediment discharge risk based on the site's slope, location and soil type when combined with buffer width.
- g. <u>Measuring Buffer Width</u>: 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.
- h. <u>Description of BMPs</u>: The SWPPP shall include a description of both structural and nonstructural BMPs used one or more times at the site, providing the following general information for each:
  - (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 for the BMP.
- i. <u>Specific Instance of BMPs</u>: 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) Where, in relation to other site features, the BMP is to be located;
  - (3) When the BMP will be installed in relation to each phase of the land disturbance procedures to complete the project; and
  - (4) Site conditions that must be met before removal of the BMP if the BMP is not a permanent BMP.
- j. <u>Disturbed Areas</u>: Slopes for disturbed areas must be defined in the SWPPP. A site map or maps defining the sloped areas for all phases of the project must be included in the SWPPP.
  - (1) For soil disturbing activities that have 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.
  - (2) 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.
  - (3) Allowances to the 14 day completion period for temporary and final stabilization may be made due to weather and equipment malfunctions. In drought-stricken areas where initiating vegetative stabilization measures immediately are infeasible, alternative stabilization measures must be employed. The use of allowances shall be documented in the SWPPP.

- (4) Interim stabilization 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. These BMPs may include a combination of sediment basins, check dams, sediment fences and mulch. 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) or if the slope is greater than 3% and greater than 150 feet in length, then the permittee shall establish interim stabilization within seven days of ceasing operations on that part of the site.
- (5) In limited circumstances, stabilization may not be required if the intended function of a specific area of the site necessitates that it remain disturbed.
- k. <u>Installation</u>: The permittee shall ensure the BMPs are properly installed at the locations and relative times specified in the SWPPP.
  - (1) Peripheral or border BMPs to control runoff from disturbed areas shall be installed or marked for preservation before general site clearing is started. Note that this requirement does not apply to earth disturbances related to initial site clearing and establishing entry, exit and access of the site, which may require that stormwater controls be installed immediately after the earth disturbance.
  - (2) For phased projects, BMPs shall be properly installed as necessary prior to construction activities.
  - (3) Stormwater discharges from disturbed areas which leave the site shall pass through an appropriate impediment to sediment movement such as a sedimentation basin, sediment traps and/or silt fences prior to leaving the land disturbance site.
  - (4) A drainage course change shall be clearly marked on a site map and described in the SWPPP.
  - (5) If vegetative stabilization measures are being implemented, stabilization is considered "installed" when all activities necessary to seed or plant the area are completed.
- 1. <u>Sedimentation Basins</u>: The SWPPP shall include a sedimentation basin for each drainage area with ten or more acres disturbed at one time.
  - (1) The sedimentation basin shall be sized to a local 2-year, 24-hour storm. A 2-year, 24-hour storm event shall be determined for the project location using the National Oceanic and Atmospheric Administration's National Weather Service Atlas 14 which can be located at <u>http://hdsc.nws.noaa.gov/hdsc/pfds/.</u>
  - (2) Basins designed and initiated under the 2012 Area-Wide Land Distrubance General Permit MO-R100038 or prior authorizations shall comply with the requirements held in those authorizations. Any construction activities designed and initiated under this authorization shall comply with the local 2-year, 24-hour storm event by January 1, 2018.
  - (3) Accumulated sediment shall be removed from the basin when basin is 50% full.
  - (4) Utilize outlet structures that withdraw water from the surface when discharging from basins and impoundments unless infeasible.
  - (5) Discharges from the basin shall not cause scouring of the banks or bottom of the receiving stream.
  - (6) The SWPPP shall require the basin be maintained until final stabilization of the disturbed area served by the basin.
  - (7) 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.
  - (8) 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 delivery. 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.

- m. <u>Pollution Prevention Measures:</u> The SWPPP shall include BMPs for pollution prevention measures. At minimum such measures must be designed, installed, implemented and maintained to:
  - (1) Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
  - (2) 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. Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in a discharge of pollutants, or where exposure of a specific material or product poses little risk or stormwater contamination (such as final products and material intended for outdoor use);
  - (3) Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures. Included but not limited to the installation of containment berms and use of drip pans at petroleum product and liquid storage tanks and containers; and
- n. <u>Roadways</u>: Where applicable, upon installation of or connection to roadways, all efforts should be made to prevent the deposition of earth and sediment onto roadways through the use of proper BMPs.
  - (1) Stormwater inlets susceptible to receiving sediment from the permitted land disturbance site shall have curb inlet protection.
  - (2) Where stormwater will flow off the end of where a roadway terminates, a sediment catching BMP such as gravel berm or silt fence shall be provided.
  - (3) Curb inlets shall be cleaned weekly or following a precipitation event that generates a run-off.
- o. <u>Dewatering</u>: Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, are prohibited unless managed by appropriate controls. The SWPPP shall include a description of any anticipated dewatering methods.
  - (1) The SWPPP shall call for specific BMPs designed to treat water pumped from trenches and excavations and in no case shall this water be pumped off-site without being treated by the specified BMPs.
- 11. <u>Good housekeeping</u> practices shall be maintained at all times to keep waste from entering waters of the state. Solid and hazardous waste management include providing trash containers and regular site cleanup for proper disposal of solid waste such as scrap building material, product/material shipping waste, and food containers and cups, and providing containers and proper disposal of waste paints, solvents and cleaning compounds. The provision of portable toilets for proper disposal of sanitary sewage and the storage of construction materials should be kept away from drainage courses and low areas.
- 12. All <u>fueling facilities</u> present shall at all times adhere to applicable federal and state regulations concerning underground storage, above ground storage and dispensers.
- 13. <u>Hazardous substances</u> that are transported, stored, or used for maintenance, cleaning, or repair shall be managed according to the provisions of the Missouri Hazardous Waste Laws and Regulations.
- 14. <u>Containers</u>: All paint, solvents, petroleum products, petroleum waste products and storage containers such as drums, cans, or cartons shall be stored according to BMPs. The materials exposed to precipitation shall be stored in watertight, structurally sound, closed containers. All containers shall be inspected for leaks or spillage during the inspection of BMPs.

- 15. <u>Amending/Updating the SWPPP</u>: The permittee shall amend and update the SWPPP as appropriate during the term of the land disturbance activity. The permittee shall amend the SWPPP at a minimum whenever the:
  - a. 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;
  - 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 excessive sediment deposits in streams or lakes); and/or
  - f. Department determines violations of water quality standards may occur or have occurred.
- 16. An individual shall be designated by the permittee as the lead for environmental matters. The lead individual for environmental matters shall have a thorough and demonstrable knowledge of the site's SWPPP and sediment and erosion control practices in general. The lead individual for environmental matters or a designated inspector knowledgeable in erosion, sediment and stormwater control principles shall inspect all structures that function to prevent pollution of waters of the state
- 17. <u>Site Inspections</u>: The permittee (or a representative of the permittee) shall conduct regularly scheduled inspections.
  - a. 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.
  - b. Inspections are only required during the project's normal working hours.
  - c. For disturbed areas that have not been finally stabilized, all installed BMPs and other pollution control measures shall be inspected for proper installation, operation and maintenance.
  - d. Areas on-site that have been stabilized must be inspected at least once per month.
    - (1) For areas where disturbed portions have undergone temporary stabilization at the same time active construction continues on other areas, inspections shall occur at least once a month while stabilized and when re-disturbed shall follow either frequency outlined in subsection h. below.
    - (2) For areas where disturbed portions have undergone final stabilization at the same time active construction continues on other areas, inspection frequency may be cease on the finally stabilized areas according to the following:
      - (a) After the first monthly inspection, inspect once more within 24 hours of a storm event of 0.25 inches or greater.
      - (b) If there are no issues or evidence of stabilization problems, further inspections may cease.
      - (c) If unstable site conditions or sediment movement are observed, the site must be restabilized and monthly inspections shall occur until final stabilization is confirmed following a storm event of 0.25 inches or greater.
  - e. All stormwater outfalls shall be inspected for evidence of erosion or sediment deposition.
  - f. When practicable the receiving stream shall also be inspected for 50 feet downstream of the outfall.
  - g. Any structural or maintenance problems shall be noted in an inspection report and corrected as soon as possible but no more than seven calendar days after the inspection.
    - (1) If weather conditions 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.
    - (2) The documentation must be filed with the regular inspection reports.
    - (3) The permittee shall correct the problem as soon as weather conditions allow.
  - h. All BMPs must be inspected in accordance to one of the two schedules listed below, and any

changes to the frequency of inspections, including switching between the options listed below, must be documented in the SWPPP:

- (1) At least once every seven 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 and within 72 hours if the event ceases during a non-work day such as a weekend or holiday; or
- (2) Once every 14 calendar days and within 24 hours of the occurrence of a storm event of 0.25 inches or greater or the occurrence of runoff from snowmelt. To determine if a storm event of 0.25 inches or greater has occurred on-site, the permittee must either keep a properly maintained precipitation gauge on site, or obtain the storm event information from a weather station near the site.
  - (a) Inspections shall be conducted within 24 hours once a storm event has produced 0.25 inches within a 24 hour period, even if the storm event is still continuing.
  - (b) If the permittee has 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 is required to conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the end of the storm.
- 18. The SWPPP must explain how the person responsible for erosion control will be notified when stormwater runoff occurs
- 19. <u>Site Inspections Reports:</u> A log of each inspection and copy of the inspection report shall be kept readily accessible and must be available upon request by the department. Electronic logs are acceptable as long as reports can be provided in a timely manner. If inspection reports are kept off-site, the SWPPP must indicate where they are stored. The inspection report shall be signed by the permittee or by the person performing the inspection if duly authorized to do so. The inspection report is to include the following minimum information:
  - a. Inspector's name;
  - b. Date of inspection;
  - c. Observations relative to the effectiveness of the BMPs;
  - d. Actions taken or necessary to correct the observed problem; and
  - e. Listing of areas where land disturbance operations have permanently or temporarily stopped.
- 20. <u>Notification to All Contractors</u>: The permittee shall be responsible for notifying 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 action or precautions shall be taken while on-site to minimize the potential for erosion and the potential for damaging any BMP. The SWPPP shall contain a record of notification; for example, a list of contractors or entities given a copy of the SWPPP or education session sign-in sheet. The permittee is responsible for any damage a subcontractor may do to established BMPs and any subsequent water quality violation resulting from the damage.
- 21. <u>Public Notification</u>: The permittee shall post a copy of the public notification sign on page 15 of this permit at the main entrance to the site. The public notification sign must be visible from the public road that provides access to the site's main entrance. 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 permit has been terminated.

# OTHER DISCHARGES

A record of each reportable release of hazardous substance shall be retained with the SWPPP and made available to the department upon request. The department may also require the submittal of a written or electronic report detailing measures taken to clean up the spill within five (5) days of the spill. Such a report must include the type of material spilled, volume, date of spill, date clean-up was completed, clean-up method, and final disposal method.

#### SAMPLING REQUIREMENTS AND EFFLUENT LIMITATIONS

The department may require sampling and reporting as a result of illegal discharges, compliance issues, complaint investigations, or other such evidence of contamination from activities at the site. If such an action is needed, the department will specify in writing any sampling requirements, including such information as location, extent and parameters.

#### RECORDS

- 1. The permittee shall retain copies of this general permit, the SWPPP and all amendments for the site, results of any monitoring and analysis, and all site inspection records. The records shall be accessible during normal business hours. The records shall be retained for a period of at least three years from the date of the Letter of Termination.
- 2. The permittee shall provide a copy 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.
- 3. 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.

#### LAND PURCHASE AND CHANGE OF OWNERSHIP

- 1. If the permittee sells any portion of the 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.
- 2. Property of any size which is part of a larger common plan of development where the property has been stabilized and the original permit terminated will require application of a new land disturbance permit for any future land disturbance activity unless exempted per 10 CSR 20-6.010(1)(B), 10 CSR 20-6.200(1)(B), and 40 CFR 122.26(a)(2)(ii).
- 3. If the entire tract is sold to a single entity, then this permit shall be terminated when the new owner obtains a new land disturbance permit for the site.
- 4. 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 while no permit is required for less than one acre of land sold.

## TERMINATION

This permit may be terminated when all projects are stabilized. The project is considered to be finally stabilized when perennial vegetation, pavement, buildings, or structures using permanent materials cover all areas that have been disturbed. With respect to areas that have been vegetated, vegetation cover shall be at least 70% over 100% of the site. In order to terminate the permit, the permittee shall notify the department by submitting *Form H- Request for Termination of a General Permit* (http://dnr.mo.gov/forms/780-1409-f.pdf).

## DUTY TO REAPPLY

Unless terminated, the permittee shall submit an application for the renewal of this permit by submitting *Form E-Application for General Permit* (<u>http://dnr.mo.gov/forms/780-0795-f.pdf</u>) and

*Form G – Application for Stormwater Permit Under the General Permit: Land Disturbance* (<u>http://dnr.mo.gov/forms/780-1408-f.pdf</u>) no later than thirty (30) days prior to the permit's expiration date. If a facility submits a timely and complete application in accordance with 10 CSR 20-6.010(5)(B), (5)(C), and (10)(E)1, as well as § 644.051.10, RSMo 2015, if the department is unable, through no fault of the permittee, to issue a renewal prior to expiration of the previous permit, the terms and conditions of the expired permit are administratively continued and will remain fully effective and enforceable until such time when a permit action is taken. Failure to submit a renewal application for a facility that is still in operation is a violation of the Missouri Clean Water Law. As part of the complete application and as required by the federal NPDES eReporting rule, participation in the department's Electronic Discharge Monitoring Report Submission System (eDMR) will be required. Facilities already participating in eDMR need not re-apply upon renewal. More information can be found at: <u>http://dnr.mo.gov/env/wpp/edmr.htm</u>. Failure to apply for renewal of a permit may result in termination of this permit and enforcement action to compel compliance with this condition and the Missouri Clean Water Law. This permit may be applied for and issued electronically once made available by the director in accordance with Section 644.051.10, RSMo.

#### MODIFICATION, REVOCATION, AND REOPENING

- The full implementation of this operating permit shall constitute compliance with all applicable federal and state statutes and regulations in accordance with §644.051.16, RSMo, and the CWA section 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 Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a) (2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:
  - a. contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
  - b. controls any pollutant not limited in the permit.
- 2. 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.

#### STANDARD CONDITIONS

These Standard Conditions incorporate permit conditions as required by 40 CFR 122.41 or other applicable state statutes or regulations. These minimum conditions apply unless superseded by requirements specified in the permit.

- 1. <u>Other Information</u>: 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.
- 2. <u>Duty to Comply</u>: 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.
- 3. <u>Duty to Provide Information</u>: The permittee shall furnish to the department, within a reasonable time, 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.

- 4. <u>Inspection and Entry</u>: 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.
- 5. 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.



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

# ANYONE WITH QUESTIONS OR CONCERNS ABOUT STORMWATER DISCHARGES FROM THIS SITE, PLEASE CONTACT THE MISSOURI DEPARTMENT OF NATURAL RESOURCES AT **1-800-361-4827**

# Missouri Department of Natural Resources Fact Sheet MO-R100038

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 (permit) 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 <u>five</u> (5) years unless otherwise specified.

Per 40 CFR 124.56, 40 CFR124.8, 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 a permit.

This Fact Sheet is for a:

- Major
  Minor
  Industrial Facility
  Variance
- Master General Permit
- Permit with widespread public interest

# **Definitions**

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.

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

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

Larger Common Plan of Development or Sale: A contiguous area where multiple separate and distinct construction activities are occurring under one plan.

Non-structural Best Management Practice: Institutional, educational or pollution prevention practices designed to limit the amount of stormwater runoff or pollutants that are generated in the landscape. An example includes ordinance development.

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 should be defined as any activity that has been

MO-R100038 Fact Sheet, Page 2 of 8

ceased without any intentions of future disturbance.

Structural Best Management Practice: Physical controls working individually or as a group, appropriate to the source, location, and area climate for the pollutant to be controlled. Examples include moving earth for sedimentation basin and planting vegetation.

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 – Facility Information**

Facility Type: Industrial Stormwater 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 SWPPP requirement to minimize pollutants of concern from this type of facility or for all facilities covered under this permit. 10 CSR 20-6.200(6)(A)7. specifies that "general permits shall contain BMP requirements and/or monitoring and reporting requirements to keep the stormwater from becoming contaminated." 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 local conditions.

While drafting this permit for renewal, the department hosted four public meetings on January 27, February 24, April 18, and May 19, 2016, which allowed stakeholders to voice concerns about conditions within the permit and submit comments during the period of initial involvement. These concerns were taken into consideration when drafting the permit.

# 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:

Please mark all appropriate designated waters of the state categories of the receiving stream.

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

Missouri Water Quality Standards (10 CSR 20-7.031) defines the Clean Water Commission water quality objectives in terms of "water uses to be maintained and the criteria to protect those uses." The receiving stream and/or 1<sup>st</sup> classified receiving stream's beneficial water uses shall be maintained in accordance with 10 CSR 20-7.031(4). The BMP requirement established by this permit are intended to be protective of all streams that fall within the categories of receiving water bodies indicated above. A general permit does not take into consideration site-specific conditions.

MO-R100038 Fact Sheet, Page 3 of 8

# <u>Part III – Applicability</u>

Condition number 5 includes support activities. Those support activities are to become part of the land disturbance permitted area and included in the acreage calculations, whether the support activities are located adjacent to, on-site or off-site from the main land disturbance construction area. For example, if the main land disturbance site is 0.6 acres and the project needs fills that is gathered from a borrow site specific to this project which equals 0.5 acres, then the total acreage for this project is an acre or more and the conditions of this permit apply to both the main construction area and the borrow area.

Condition number 14 was expanded to include a more comprehensive list of state and federal requirements that must be taken into consideration.

If the proposed project encounters and will potentially affect a species of concern, please report it to the Missouri Department of Conservation and the United States Fish and Wildlife Service. For more information about requirements of the Endangered Species Act, please visit the following links:

- 1. To determine the potential for species of concern within or near a project, please visit the United States Fish and Wildlife Services' "Information, Planning and Conservation" website at <a href="http://ecos.fws.gov/ipac/">http://ecos.fws.gov/ipac/</a>.
- 2. If there are listed species in the county or township, check to see if critical habitat has been designated and if that area overlaps or is near the project area. Critical habitat designations and associated requirements may also be found at 50 CFR Parts 17 and 226. For additional information, use the map view tool at <u>http://criticalhabitat.fws.gov/crithab/</u> to find data specific to the state and county.

The Missouri Department of Conservation's internet site for the Natural Heritage Review may be very helpful and can be found at the following link, <u>https://naturalheritagereview.mdc.mo.gov/</u>.

# Part IV - Exemptions

Condition Number 2 was added to cite all state exemptions from permitting requirements, combining several previous cited exemptions into one condition and reference. This includes an exemption for linear construction where the entire disturbance, including clearing of land to access the linear disturbance, is less than two feet in width.

Condition Number 3 was added to cite federal regulations that exclude land disturbance projects related to the installation or maintenance work for oil and gas related activities.

# Part V - Rationale of Technology Based Limitations & Permit Conditions

#### 303(d) LIST & TOTAL MAXIMUM DAILY LOAD (TMDL):

Section 303(d) of the Federal CWA requires that each state identify waters that are 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 that are impaired but not addressed by normal water pollution control programs.

#### **ANTI-BACKSLIDING:**

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

Applicable: Backsliding proposed in this permit conforms to the anti-backsliding provisions of Section 402(o) of the CWA and 40 CFR 122.44. The department has determined that technical mistakes were made in the previous permit [CWA 402(o)(2)(B)(ii)]. The Department has determined that technical mistakes or mistaken interpretations of law were made in issuing the

permit under section 402(a)(1)(b).

**Settleable Solids:** The Settleable Solids limitation was removed since has been determined to not be a statewide technology or water quality based limitation given a variability of soil type in the state. Increased technology based best management practices have been included and are a more appropriate technology based requirement.

Water Quality Standard Narrative Prohibitions. The previous permit contained language which referenced narrative compliance with the water quality standards found in 10 CSR 20-7.031. In order to comply with 40 CFR 122.44(d)(1), the permit writer has conducted reasonable potential determinations for each general and applicable specific criterion and established numeric effluent limitations where reasonable potential exists. While the removal of the previous permit language creates the appearance of backsliding, the permit writer has evaluated discharges associated with this general permit as to whether reasonable potential to cause excursions of specific or general criteria on a statewide level and found that no reasonable potential exists given the proper implementation of a Stormwater Pollution Prevention Plan and associated best management practices and that the requirements of this permit are equally protective as compared to the previous permit. Therefore, given this new information, and the fact that the previous permit special condition was not consistent with 40 CFR 122.44(d)(1), an error occurred in the establishment of the general criteria as a special condition of the previous permit.

#### **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 that the best avenue forward for implementing the Antidegradation requirements into general permits is by requiring the appropriate development and maintenance of a SWPPP. The SWPPP must identify all Best Management Practices (BMPs) that are reasonable and effective, 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 new BMPs that are reasonable and cost effective. New facilities seeking coverage under this permit are required to develop a SWPPP that includes this analysis and documentation of appropriate BMPs. Renewal of coverage for a facility requires a review of the SWPPP to assure that the selected BMPs continue to be appropriate.

Applicable: The main pollutant of concern in this permit is sediment. Compliance with the technology-based limitations established in this permit for the protection of General Criteria, along with the evaluation and implementation of BMPs as documented in the SWPPP, meets the requirements of Missouri's Antidegradation Review [10 CSR 20-7.031(3), 10 CSR 20-7.031 Table A, and 10 CSR 20-7.015(9)(A)5].

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

In accordance with 40 CFR 122.44(3)(k) Best Management Practices (BMPs), BMPs are implemented 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 <u>Developing Your Stormwater Pollution Prevention Plan, a Guide for Construction</u> <u>Sites</u> (EPA 833-R-06-004; <u>https://www3.epa.gov/npdes/pubs/sw\_swppp\_guide.pdf</u>) published by the United States Environmental Protection Agency (EPA) in May 2007, BMPs are measures or practices used to reduce the amount of pollution entering waters of the state. BMPs may take the form of a process, activity, or physical structure. EPA developed resources and tools related to construction stormwater along with the BMPs to control and minimize stormwater (<u>https://www.epa.gov/npdes/stormwaterdischarges-construction-activities</u>). Along with EPA's resources and tools, the International Stormwater BMP database (<u>www.bmpdatabase.org/index.htm</u>) may provide guidance on BMPs appropriate for specific industries.

Additionally in accordance with 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 stormwater discharges.

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

The new permit has been revised to allow permittees to store SWPPP documents electronically as long as they can be provided in an expedient manner.

Release of a hazardous substance must be reported to the department in accordance with 10 CSR 24-3.010. If the spill occurs outside of normal business hours, or if the permit holder cannot reach regional office staff for any reason, the permit holder is instructed to report the spill to the department's 24 hour Environmental Emergency Response hotline at (573) 634-2436 at the earliest practicable moment after discovery. Leaving a message on a department staff member voice-mail does not satisfy this reporting requirement.

#### 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.

#### **SPECIFIC CRITERIA CONSIDERATIONS:**

An evaluation of discharges associated with land disturbance activities has been conducted to determine if any pollutants discharged under this general permit would have reasonable potential to cause or contribute toward an excursion of specific water quality criterion. Pollutants discharged from land disturbance activities are not commonly associated with pollutants listed as specific criteria in the Missouri Water Quality Standards; therefore, reasonable potential to cause an excursion of a specific criterion does not exist.

#### **GENERAL CRITERIA CONSIDERATIONS:**

In accordance with 40 CFR 122.44(d)(1), effluent limitations shall be placed into the permit for those pollutants which have been determined to cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality. The rule further states that pollutants which have been determined to cause, have the reasonable potential to cause, or contribute to an excursion above a narrative criterion within an applicable State water quality standard, the permit shall contain a numeric effluent limitation to protect that narrative criterion. In order to comply with this regulation, the permit writer will complete reasonable potential determinations on whether the discharge will violate any of the general criteria listed in 10 CSR 20-7.031(4). These specific requirements are listed below followed by derivation and discussion [the lettering matches that of the rule itself, under 10 CSR 20-7.031(4)]. It should also be noted that Section 644.076.1, RSMo states that it shall be unlawful for any person to cause or permit any discharge of water contaminants from any water contaminant or point source located in Missouri that is 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.

- (a) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses. The SWPPP requires implementation of best management practices to store, prevent, or minimize stormwater and/or any related land disturbance activity discharges (namely sediment). If one follows their SWPPP and other permit conditions including timely inspections, no reasonable potential to cause an excursion of this narrative exists. Additionally, there had been no indication to the Department that a stream has had issues maintaining beneficial uses as a result of the controlled and managed stormwater discharges per the SWPPP. Therefore, based on the information reviewed during the drafting of this permit, no reasonable potential to cause or contribute to an excursion of this criterion exists.
- (b) <u>Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or</u> <u>prevent full maintenance of beneficial uses</u>. Please see (a) above as justification is the same.
- (c) <u>Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity</u>, <u>offensive odor or prevent full maintenance of beneficial uses</u>. Please see (a) above as justification is the same.
- (d) <u>Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life</u>. This permit addresses discharges from land disturbance activities and it not expected to include an toxic pollutants. Best management practices are to be addressed in the SWPPP should any toxic pollutant of concern be on-site.
- (e) <u>There shall be no significant human health hazard from incidental contact with the water</u>. Please see (a) above as justification is the same.
- (f) <u>There shall be no acute toxicity to livestock or wildlife watering</u>. Please see (d) above as justification is the same.
- (g) <u>Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community</u>. Please see (a) above as justification is the same.
- (h) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247. Please see (a) above. Additionally, any solid wastes received or produced at this facility are wholly contained in appropriate storage facilities, are not discharged, and are disposed of offsite. Therefore, this discharge does not have reasonable potential to cause or contribute to an excursion of this criterion.

The settleable solids requirement was removed from this permit and was replaced with additional, more specific BMP requirements. The settleable solids limit was determined not to be protective of all waters across the state, therefore, it was removed. Examples of these BMPs include requirements to:

- Install and maintain perimeter controls along areas of the site that will receive pollutant discharges;
- Minimize sediment track-out from the site;
- Provide storage for runoff up to and including a 2-year, 24-hour storm event when designing sedimentation basins; and
- Direct stormwater to vegetated areas.

The minimum buffer width was increased from 25 feet to 50 feet. Studies have shown that a 50 foot vegetative buffer more adequately treats sediment from stormwater discharges. This appears to be standard in EPA's permit as well as in many other states. A literature review was conducted to assess the effectiveness of buffer widths in relation to sediment removal. In an early literature review on grass buffers in agricultural settings, Dosskey (2001) concluded that 40 -100% of sediment entering from cultivated fields was removed using buffer strips 0.5 to 20 meters. Liu *et al.* (2008) conducted an analysis of 85 estimates of sediment removal by vegetated buffers. They found that sediment removal efficiency ( $E_{s}$  the percentage of inflowing sediment trapped within a buffer) increased with buffer width according to the relationship:  $E_s = 13.4 \log_e (w)+56.9$  in

MO-R100038 Fact Sheet, Page 7 of 8

which w (m) is buffer width. This equation predicts that  $E_s$  increases from 78% for a 5 meter wide buffer to 88% and 97% at widths of 10 meters and 20 meters, respectively. Yaun *et al.* (2009; 93 estimates) and Zhang *et al.* (2010; 81 estimates) garnered similar results to Liu *et al.* 

In order to design controls that match the sediment removal efficiency of a 50- foot buffer, first the permittee must know what this efficiency is for the 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 sediment controls used to reduce the discharge of sediment prior to the buffer.

Sediment removal efficiencies are based on the U.S. Department of Agriculture's RUSLE2 (Revised Universal Soil Loss Equation 2) model for slope profiles using a 100-foot long exposed slopes.

Sediment removal is defined as the annual sediment delivered at the downstream end of the 50-foot natural buffer (tons/yr/acre) divided by the annual yield from cleared area (tons/yr/acre).

Sediment removal is in part a function of (1) a perimeter control (i.e., silt fence) located between the disturbed portion of the site and the upland edge of the natural buffer and (2) stormwater flows traveling through a 50-foot buffer of undisturbed natural vegetation.

Additional guidance may be found at <u>https://www.epa.gov/sites/production/files/2017-02/documents/2017\_cgp\_final\_appendix\_g\_buffer\_reqs\_508.pdf</u>.

Inspection frequencies: Site inspection frequencies have been changed from the previous permit based upon guidance from the USEPA and from stakeholder discussions. These frequencies will allow flexibility but will still allow for frequent enough inspections to ensure that all BMPs are adequately functioning.

# Part VI – Effluent Limitations Determination

In this general permit, Technology-Based Effluent Limitations are established through the SWPPP and BMP requirements. Effective BMPs may have to be designed on a site-specific basis. The implementation of monitoring provides a tool for each facility to evaluate the effectiveness of BMPs to ensure protection of water quality.

# Part VII - Land Purchase and Change of Ownership

A "larger common plan of development or sale" is a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under one plan. This term is used in conjunction with common promotional plan, as defined in §644, RSMo.

Any portion of a project that is sold to a developer is still considered part of a larger common plan of development or sale and will require a permit.

If a portion of a site is sold to an individual for the purpose of building his or her private residence:

- A permit is required if the portion of land sold is equal to or greater than one acre.
- A permit is not required if the portion of land sold is less than one acre.

# <u>Part VIII – Termination</u>

The word 'plant density' was removed from the first paragraph since the department determined that percent of vegetative cover more accurately describes the vegetative requirements of this permit. This decision was made after discussion within the department and with stakeholders.

It is preferable that temporary BMPs such as sediment fence be removed prior to permit termination to

MO-R100038 Fact Sheet, Page 8 of 8

eliminate potential solid waste issues that may occur as a result of unnecessary and unmaintained BMPs.

Additional options for winter site stabilization as part of the vegetation requirement may exist, such as using a seeded erosion control blanket.

# Part IX – Duty to Reapply

This section has been revised to reflect the current applicable statutes which require applicants to submit an application for coverage 30 days prior to expiration of this permit. Currently, a paper application if required; however, applicants are to submit an application for coverage electronically as soon as they are made available by the director. The department will announce the availability status of the new permit and the process to reapply at least 60 days prior to the expiration of the existing permit.

# Part X – Standard Conditions

This section was revised to only include the standard conditions that specifically apply to this permit. All other conditions have been removed.

# Part XI – 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 NOTICE:**

The department shall give public notice that 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 seeking comments on this permit occurred from March 31 to May 1, 2017.

**DATE OF FACT SHEET:** 06/16/2017

COMPLETED BY: CHRISTOPHER MILLER ENVIRONMENTAL SPECIALIST 573-526-3337 christopher.miller@dnr.mo.gov EDITED BY: STACIA BAX ENVIRONMENTAL SUPERVISOR 573-526-4586 <u>stacia.bax@dnr.mo.gov</u>