PROJECT MANUAL

Connect Camp Clark Sewer System
to City of Nevada Sewer System

Camp Clark Training Site

Nevada, Missouri

Designed By: Allgeier, Martin and Associates
7231 East 24th Street
Joplin, MO. 65804-3485

Date Issued: June 14, 2024

Project No.: T2301-02

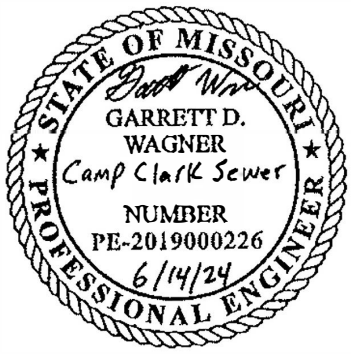
STATE *of* MISSOURI

OFFICE *of* ADMINISTRATION
Facilities Management, Design & Construction

SECTION 000107
PROFESSIONAL SEALS AND CERTIFICATIONS

PROJECT NUMBER: T2301-02 Connect Sewer System to City of Nevada Sewer System

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:



06-14-2024

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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 Used)

PART 3 - EXECUTION

3.1 LIST OF DRAWINGS

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

	TITLE	SHEET #	DATE	CAD #
1.	Cover Sheet	Sheet G-001	06/14/2024	G-001.dwg
2.	Overall Site Plan	Sheet G-002	06/14/2024	G-002.dwg
3.	Pressure Sewer Plan & Profile	Sheet C-101	06/14/2024	C-101.dwg
4.	Pressure Sewer Plan & Profile	Sheet C-102	06/14/2024	C-102.dwg
5.	Pressure Sewer Plan & Profile	Sheet C-103	06/14/2024	C-103.dwg
6.	Pressure Sewer Plan & Profile	Sheet C-104	06/14/2024	C-104.dwg
7.	Pressure Sewer Plan & Profile	Sheet C-105	06/14/2024	C-105.dwg
8.	Pressure Sewer Plan & Profile	Sheet C-106	06/14/2024	C-106.dwg
9.	Pressure Sewer Plan & Profile	Sheet C-107	06/14/2024	C-107.dwg
10.	Pressure Sewer Plan & Profile	Sheet C-108	06/14/2024	C-108.dwg
11.	Pressure Sewer Plan & Profile	Sheet C-109	06/14/2024	C-109.dwg
12.	Pressure Sewer Plan & Profile	Sheet C-110	06/14/2024	C-110.dwg
13.	Gravity Sewer Plan & Profile	Sheet C-111	06/14/2024	C-111.dwg
14.	Lift Station Site Plan	Sheet C-112	06/14/2024	C-112.dwg
15.	Lagoon Demolition and Grading Plan	Sheet C-113	06/14/2024	C-113.dwg
16.	Stormwater Pollution Prevention Plan	Sheet C-114	06/14/2024	C-114.dwg
17.	Lift Station Structure Plan and Section	Sheet C-501	06/14/2024	C-501.dwg
18.	Standard Construction Details	Sheet C-502	06/14/2024	C-502.dwg
19.	Standard Construction Details	Sheet C-503	06/14/2024	C-503.dwg

20.	Standard Construction Details	Sheet C-504	06/14/2024	C-504.dwg
21.	Lift Station Electrical	Sheet E-101	06/14/2024	E-101.dwg
22.	Lift Station Electrical Control Diagram	Sheet E-102	06/14/2024	E-102.dwg
23.	Lift Station Electrical Details	Sheet E-103	06/14/2024	E-103.dwg

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. Connect Camp Clark Sewer System to City of Nevada Sewer System
Camp Clark Training Site
Nevada, Missouri
Project No.: T2301-02

3.0 BIDS WILL BE RECEIVED:

A. Until: 1:30 PM, August 29, 2024

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

4.0 DESCRIPTION:

A. Scope: The project includes Sanitary sewer system improvements at Camp Clark in Nevada, MO. Work includes demolishing the existing wastewater treatment lagoons, building a lift station, and installing approximately 7,964 L.F. of 6" diameter pressure sewer pipe to send all on-site sewage to the City of Nevada's sanitary sewer system.

B. MBE/WBE/SDVE Goals: MBE 10%, WBE 10%, and SDVE 3%. **NOTE: Only MBE/WBE firms certified by the State of Missouri Office of Equal Opportunity as of the date of bid opening, or SDVE(s) meeting the requirements of Section 34.074, RSMo and 1 CSR 30-5.010, can be used to satisfy the MBE/WBE/SDVE participation goals for this project.**

C. **NOTE: Bidders are provided new Good Faith Effort (GFE) forms on MissouriBUYS.

D. In addition to the State of Missouri MBE/WBE/SDVE participation goals set forth herein and in the bid documents for this project, the contractor on a federally funded/assisted construction project is subject to federal Executive Order 11246. The Bidder's attention is drawn to the Notice of Requirement for Affirmative Action To Ensure Equal Employment Opportunity (Executive Order 11246, 41 C.F.R. 60-4.2) in Section 007333, SUPPLEMENTARY GENERAL CONDITIONS FOR FEDERALLY FUNDED/ASSISTED CONSTRUCTION PROJECTS, which is incorporated by reference.

5.0 PRE-BID MEETING:

A. Place/Time**:** 10:00 AM, August 8, 2024, at Missouri National Guard - Camp Clark Training Site Headquarters Building

18159 South K Highway Nevada, MO. 64772

B. Access to State of Missouri property requires presentation of a photo ID by all persons.

6.0 HOW TO GET PLANS & SPECIFICATIONS:

A. View Only Electronic bid sets are available at no cost or paper bid sets for a deposit of $100.00 from American Document Solutions (ADS). MAKE CHECKS PAYABLE TO: American Document Solutions. Mail to: American Document Solutions, 1400 Forum Blvd., Suite 7A, Columbia, Missouri 65203. Phone 573-446-7768, Fax 573-355-5433, https://www.adsplanroom.net. NOTE: Prime contractors will be allowed a maximum of two bid sets at the deposit rate shown above. Other requesters will be allowed only one bid set at this rate. Additional bid sets or parts thereof may be obtained by any bidder at the cost of printing and shipping by request to American Document Solutions at the address shown above. **Bidder must secure at least one bid set to become a planholder.**

B. **Refunds: Return plans and specifications in unmarked condition within 15 working days of bid opening to American Document Solutions, 1400 Forum Blvd., Suite 7A, Columbia, Missouri 65203. Phone 573-446-7768, Fax 573-355-5433. Deposits for plans not returned within 15 working days shall be forfeited.**

C. Information for upcoming bids, including downloadable plans, specifications, Invitation for Bid, bid tabulation, award, addenda, and access to the ADS planholders list, is available on the Division of Facilities Management, Design and Construction's web site: https://oa.mo.gov/facilities/bid-opportunities/bid-listing-electronic-plans.

7.0 POINT OF CONTACT:

A. Designer: Allgeier, Martin and Associates, Inc., Garrett Wagner, 417-680-7287, email: Garrett.Wagner@amce.com

B. Project Manager: Jeremy Newton, 573-308-6894, email: jeremy.l.newton.nfg@army.mil

8.0 GENERAL INFORMATION:

A. The State reserves the right to reject any and all bids and to waive all informalities in bids. No bid may be withdrawn for a period of 20 working days subsequent to the specified bid opening time. The contractor shall pay not less than the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed, as determined by the Missouri Department of Labor and Industrial Relations and as set out in the detailed plans and specifications.

B. Bid results will be available at https://oa.mo.gov/facilities/bid-opportunities/bid-listing-electronic-plans after it is verified that at least one bid is awardable and affordable.

C. This is a federally funded/assisted construction project that requires compliance by the awarded Bidder with applicable federal laws and

regulations. The Bidder should review Section 007333, Supplementary General Conditions for Federally Funded/Assisted Construction Projects and Section 007334, Terms and Conditions for Contractor Receipt of Federal ARPA SFRF Funds, which are made part of this Invitation to Bid and will be made part of the resulting contract by reference.

Very Important MissouriBUYS Instructions to Help Submit a Bid Correctly

A. The bidder shall submit his or her bid and all supporting documentation on MissouriBUYS eProcurement System. No hard copy bids shall be accepted. Go to https://missouribuys.mo.gov and register. The bidder must register and complete a profile fully with all required documents submitted prior to submitting a bid.

B. Once registered, log in.
1. Under "Solicitation" select "View Current Solicitations."
2. Under "Filter by Agency" select "OA-FMDC-Contracts Chapter 8", then click "Filter Solicitation" button.
3. Select "Active Solicitations" tab.
4. To see the Solicitation Summary, click on the Project Number and the summary will open. Click each heading to open detailed information.

C. Here are simplified instructions for uploading the bid to MissouriBUYS:
1. Find the solicitation by completing Steps 1 through 4 above.
2. Select the three dots under "Actions." Select "Add New Response."
3. When the Quote box opens, give the response a title and select "OK."
4. The detailed solicitation will open. Select "Check All" for the Original Solicitation Documents, open each document, and select "Accept." If this step is not completed, a bid cannot be uploaded. Scroll to the bottom of the page and select "Add Attachments." If you do not see this command, not all documents have been opened and accepted.
5. The Supplier Attachments box will open. Select "Add Attachment" again.
6. The Upload Documents box will open. Read the instructions for uploading. Disregard the "Confidential" check box.
7. Browse and attach up to 5 files at a time. Scroll to bottom of box and select "Upload." The Supplier Attachments box will open. Repeat Steps 5 through 7 if more than 5 files are to be uploaded.
8. When the Supplier Attachments box opens again and uploading is complete, select "Done." A message should appear that the upload is successful. If it does not, go to the Bidder Response tab and select "Submit."
9. The detailed solicitation will open. At the bottom select "Close."

D. Any time a bidder wants to modify the bid, he or she will have to submit a new one. FMDC will open the last response the bidder submits. The bidder may revise and submit the bid up to the close of the solicitation (bid date and time). Be sure to allow for uploading time so that the bid is successfully uploaded prior to the 1:30 PM deadline; we can only accept the bid if it is uploaded before the deadline.

E. If you want to verify that you are uploading documents correctly, please contact Paul Girouard: 573-751-4797, paul.girouard@oa.mo.gov ; April Howser: 573-751-0053, April.Howser@oa.mo.gov ; or Mandy Roberson: 573-522-0074, Mandy.Roberson@oa.mo.gov.

F. If you are experiencing login issues, please contact Web Procure Support (Proactis) at 866-889-8533 anytime from 7:00 AM to 7:00 PM Central Time, Monday through Friday. If you try using a userid or password several times that is incorrect, the system will lock you out. Web Procure Support is the only option to unlock you! If you forget your userid or password, Web Procure Support will provide a temporary userid or password. Also, if it has been a while since your last successful login and you receive an "inactive" message, contact Web Procure (Proactis). If you are having a registration issue, you may contact Cathy Holliday at 573-751-3491 or by email: cathy.holliday@oa.mo.gov.

SECTION 002113 – INSTRUCTIONS TO BIDDERS

1.0 - SPECIAL NOTICE TO BIDDERS

A. If awarded a contract, the Bidder's employees, and the employees of all subcontractors, who perform the work on the project must adhere to requirements in Section 013513 – Site Security and Health Requirements as applicable per Agency.

B. The Bidder's prices shall include all city, state, and federal sales, excise, and similar taxes that may lawfully be assessed in connection with the performance of work, and the purchased of materials to be incorporated in the work. THIS PROJECT IS NOT TAX EXEMPT.

2.0 - BID DOCUMENTS

A. The number of sets obtainable by any one (1) party may be limited in accordance with available supply.

B. For the convenience of contractors, sub-contractors and suppliers, copies of construction documents are on file at the office of the Director, Division of Facilities Management, Design and Construction and on the Division's web site - https://oa.mo.gov/facilities/bid-opportunities/bid-listing-electronic-plans.

3.0 - BIDDERS' OBLIGATIONS

A. Bidders must carefully examine the entire site of the work and shall make all reasonable and necessary investigations to inform themselves thoroughly as to the facilities available as well as to all the difficulties involved in the completion of all work in accordance with the specifications and the plans. Bidders are also required to examine all maps, plans and data mentioned in the specifications. No plea of ignorance concerning observable existing conditions or difficulties that may be encountered in the execution of the work under this contract will be accepted as an excuse for any failure or omission on the part of the contractor to fulfill in every detail all of the requirements of the contract, nor accepted as a basis for any claims for extra compensation.

B. Under no circumstances will contractors give their plans and specifications to another contractor. Any bid received from a contractor whose name does not appear on the list of plan holders may be subject to rejection.

4.0 - INTERPRETATIONS

A. No bidder shall be entitled to rely on oral interpretations as to the meaning of the plans and specifications or the acceptability of alternate products, materials, form or type of construction. Every request for interpretation shall be made in writing and submitted with all supporting documents not less than five (5) working days before opening of bids. Every interpretation made to a bidder will be in the form of an addendum and will be sent as promptly as is practicable to all persons to whom plans and specifications have been issued. All such addenda shall become part of the contract documents.

B. Approval for an "acceptable substitution" issued in the form of an addendum as per Paragraph 4A above, and as per Article 3.1 of the General Conditions; ACCEPTABLE SUBSTITUTIONS shall constitute approval for use in the project of the product.

C. An "acceptable substitution" requested after the award of bid shall be approved if proven to the satisfaction of the Owner and the Designer as per Article 3.1, that the product is acceptable in design, strength, durability, usefulness, and convenience for the purpose intended. Approval of the substitution after award is at the sole discretion of the Owner.

D. A request for "Acceptable Substitutions" shall be made on the Section 006325 Substitution Request Form. The request shall be sent directly to the project Designer. A copy of said request should also be mailed to the Owner, Division of Facilities Management, Design and Construction, Post Office Box 809, Jefferson City, Missouri 65102.

5.0 - BIDS AND BIDDING PROCEDURE

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

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

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

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

B. All bids shall be submitted without additional terms and conditions, modification or reservation on the bid forms with each space properly filled. Bids not on these forms will be rejected.

C. All bids shall be accompanied by a bid bond executed by the bidder and a duly authorized surety company, certified check, cashier's check or bank draft made payable to the Division of Facilities Management, Design and Construction, State of Missouri, in the amount indicated on the bid form, Section 004113. Failure of the contractor to submit the full amount required shall be sufficient cause to reject his bid. The bidder agrees that the proceeds of the check, draft or bond shall become the property of the State of Missouri, if for any reason the bidder withdraws his bid after closing, or if on notification of award refuses or is unable to execute tendered contract, provide an acceptable performance and payment bond, provide evidence of required insurance coverage and/or provide required copies of affirmative action plans within ten (10) working days after such tender.

D. The check or draft submitted by the successful bidder will be returned after the receipt of an acceptable performance and payment bond and execution of the formal contract. Checks or drafts of all other bidders will be returned within a reasonable time after it is determined that the bid represented by same will receive no further consideration by the State of Missouri. Bid bonds will only be returned upon request.

6.0 - SIGNING OF BIDS

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

B. A bid from a partnership or joint venture shall require only one signature of a partner, an officer of the joint venture authorized to bind the venture or an attorney-in-fact. If the bid is signed by an officer of a joint venture or an attorney-in-fact, a document evidencing the individual's authority to execute contracts should be included with the bid form.

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

D. A bid from a corporation shall have the correct corporate name thereon and the signature of an authorized officer of the corporation manually written. Title of office held by the person signing for the corporation shall appear, along with typed name of said individual. Corporate license number shall be provided and, if a corporation organized in a state other than Missouri, a Certificate of Authority to do business in the State of Missouri shall be attached. In addition, for corporate proposals, the President or Vice-President should sign as the bidder. If the signatory is other than the corporate president or vice president, the bidder must provide satisfactory evidence that the signatory has the legal authority to bind the corporation.

E. A bid should contain the full and correct legal name of the Bidder. If the Bidder is an entity registered with the Missouri Secretary of State, the Bidder's name on the bid form should appear as shown in the Secretary of State's records.

F. The Bidder should include its corporate license number on the Bid Form and, if the corporation is organized in a state other than Missouri, a Certificate of Authority to do business in the State of Missouri shall be attached to the bid form.

7.0 - RECEIVING BID SUBMITTALS

A. It is the bidder's sole responsibility to assure receipt by Owner of bid submittals by the date and time specified in the Invitation for Bid. Bids received after the date and time specified shall not be considered by the Owner.

B. Bids must be submitted through the MissouriBUYS statewide eProcurement system (https://www.missouribuys.mo.gov/) in accordance with the instructions for that system. The Owner shall only accept bids submitted through MissouriBUYS. Bids received by the Owner through any other means, including hard copies, shall not be considered and will be discarded by the Owner unopened.

C. To respond to an Invitation for Bid, the Bidder must first register with MissouriBUYS by going through the MissouriBUYS Home Page (https://www.missouribuys.mo.gov/), clicking the "Register" button at the top of the page, and completing the Vendor Registration. Once registered, the Bidder accesses its account by clicking the "Login" button at the top of the MissouriBUYS Home Page. Enter your USERID and PASSWORD, which the Bidder will select. Under Solicitations, select "View Current Solicitations." A new screen will open. Under "Filter by Agency" select "OA-FMDC-Contracts Chapter 8." Under "Filter by Opp. No." type in the State Project Number. Select "Submit." Above the dark blue bar, select "Other Active Opportunities." To see the Solicitation Summary, single click the Opp. No. (Project Number) and the summary will open. Single quick click each blue bar to open detailed information. The Bidder must read and accept the Original Solicitation Documents and complete all identified requirements. The Bidder should download and save all of the Original Solicitation Documents on its computer so that the Bidder can prepare its response to these documents. The Bidder should upload its completed response to the downloaded documents as an attachment to the electronic solicitation response.

D. Step-by-step instructions for how a registered vendor responds to a solicitation electronically are provided in Section 001116 – Invitation For Bid.

E. The Bidder shall submit its bid on the forms provided by the Owner on MissouriBUYS with each space fully and properly completed, including all amounts required for alternate bids, unit prices, cost accounting data, etc. The Owner may reject bids that are not on the Owner's forms or that do not contain all requested information.

F. No Contractor shall stipulate in his bid any conditions not contained in the specifications or standard bid form contained in the contract documents. To do so may subject the Contractor's bid to rejection.

G. The completed forms shall be without interlineations, alterations or erasures.

8.0 - MODIFICATION AND WITHDRAWAL OF BIDS

A. Bidder may withdraw his bid at any time prior to scheduled closing time for receipt of bids, but no bidder may withdraw his bid for a period of twenty (20) working days after the scheduled closing time for receipt of bids.

B. The Bidder shall modify his or her original bid by submitting a revised bid on MissouriBUYS.

9.0 - AWARD OF CONTRACT

A. The Owner reserves the right to reject any and/or all bids and further to waive all informalities in bidding when deemed in the best interest of the State of Missouri.

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

C. The Owner shall award a contract to the lowest, responsive, responsible Bidder in accordance with Section 8.250, RSMo. No contract will be awarded to any Bidder who has had a contract with the Owner terminated within the preceding twelve months for material breach of contract or who has been suspended or debarred by the Owner.

D. Award of alternates, if any, will be made in numerical order unless all bids received are such that the order of acceptance of alternates does not affect the determination of the lowest, responsive, responsible bidder.

E. No bid shall be considered binding upon the Owner until the written contract has been properly executed, a satisfactory bond has been furnished, evidence of required insurance coverage, submittal of executed Section 004541, Affidavit of Work Authorization form, documentation evidencing enrollment and participation in a federal work authorization program has been received and an affirmative action plan submitted. Failure to execute and return the contract and associated documents within the prescribed period of time shall be treated, at the option of the Owner, as a breach of bidder's obligation and the Owner shall be under no further obligation to bidder.

F. If the successful bidder is doing business in the State of Missouri under a fictitious name, he shall furnish to Owner, attached to the Bid Form, a properly certified copy of the certificate of Registration of Fictitious Name from the State of Missouri, and such certificate shall remain on file with the Owner.

G. Any successful bidder which is a corporation organized in a state other than Missouri shall furnish to the Owner, attached to the Bid Form, a properly certified copy of its current Certificate of Authority to do business in the State of Missouri, such certificate to remain on file with the Owner. No contract will be awarded by the Owner unless such certificate is furnished by the bidder.

H. Any successful bidder which is a corporation organized in the State of Missouri shall furnish at its own cost to the Owner, if requested, a Certificate of Good Standing issued by the Secretary of State, such certificate to remain on file with the Owner.

I. Transient employers subject to Sections 285.230 and 285.234, RSMo, (out-of-state employers who temporarily transact any business in the State of Missouri) may be required to file a bond with the Missouri Department of Revenue. No contract will be awarded by the Owner unless the successful bidder certifies that he has complied with all applicable provisions of Section 285.230-234.

J. Sections 285.525 and 285.530, RSMo, require business entities to enroll and participate in a federal work authorization program in order to be eligible to receive award of any state contract in excess of $5,000. Bidders should submit with their bid an Affidavit of Work Authorization (Section 004541) along with appropriate documentation evidencing such enrollment and participation. Section-004541, Affidavit of Work Authorization is located on the MissouriBUYS solicitation for this project. Bidders must also submit an E-Verify Memorandum before the Owner may award a contract to the Bidder. Information regarding a E-Verify is located at https://www.uscis.gov/e-verify/. The contractor shall be responsible for ensuring that all subcontractors and suppliers associated with this contract enroll in E-Verify.

10.0 - CONTRACT SECURITY

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

11.0 - LIST OF SUBCONTRACTORS

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

12.0 - WORKING DAYS

A. Contract duration time is stated in working days and will use the following definition in determining the actual calendar date for contract completion:

1. Working days are defined as all calendar days except Saturdays, Sundays and the following State of Missouri observed holidays: New Year's Day, Martin Luther King, Jr. Day, Lincoln Day, Washington's Birthday, Truman Day, Memorial Day, Juneteenth, Independence Day, Labor Day, Columbus Day, Veterans Day, Thanksgiving Day and Christmas Day.

13.0 - AMERICAN AND MISSOURI - MADE PRODUCTS AND FIRMS

A. By signing the bid form and submitting a bid on this project, the Bidder certifies that it will use American and Missouri products as set forth in Article 1.7 of the General Conditions. Bidders are advised to review those requirements carefully prior to bidding.

B. A preference shall be given to Missouri firms, corporations or individuals, or firms, corporations or individuals that maintain Missouri offices or places of business, when the quality of performance promised is equal or better and the price quoted is the same or less.

C. Pursuant to Section 34.076, RSMo, a contractor or Bidder domiciled outside the boundaries of the State of Missouri shall be required, in order to be successful, to submit a bid the same percent less than the lowest bid submitted by a responsible contractor or Bidder domiciled in Missouri as would be required for such a Missouri domiciled contractor or Bidder to succeed over the bidding contractor or Bidder domiciled outside Missouri on a like contract or bid being let in the person's domiciliary state and, further, the contractor or Bidder domiciled outside the boundaries of Missouri shall be required to submit an audited financial statement as would be required of a Missouri domiciled contractor or Bidder on a like contract or bid being let in the domiciliary state of that contractor or Bidder.

14.0 – ANTI-DISCRIMINATION AGAINST ISRAEL ACT CERTIFICATION:

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

15.0 - MBE/WBE/SDVE INSTRUCTIONS

A. Definitions:

1. **"MBE"** means a Minority Business Enterprise.

2. **"MINORITY"** has the same meaning as set forth in 1 C.S.R. 10-17.010.

3. **"MINORITY BUSINESS ENTERPRISE"** has the same meaning as set forth in section 37.020, RSMo.

4. **"WBE"** means a Women's Business Enterprise.

5. **"WOMEN'S BUSINESS ENTERPRISE"** has the same meaning as set forth in section 37.020, RSMo.

6. **"SDVE"** means a Service-Disabled Veterans Enterprise.

7. **"SERVICE-DISABLED VETERAN"** has the same meaning as set forth in section 34.074, RSMo.

8. **"SERVICE-DISABLED VETERAN ENTERPRISE"** has the same meaning as "Service-Disabled Veteran Business" set forth in section 34.074, RSMo.

B. MBE/WBE/SDVE General Requirements:

1. For all bids greater than $100,000, the Bidder shall obtain MBE, WBE and SDVE participation in an amount equal to or greater than the percentage goals set forth in the Invitation for Bid and the Bid Form, unless the Bidder is granted a Good Faith Effort waiver by the Director of the Division, as set forth below. If the Bidder does not meet the MBE, WBE and SDVE goals, or make a good faith effort to do so, the Bidder shall be non-responsive, and its bid shall be rejected.

2. The Bidder should submit with its bid all of the information requested in the MBE/WBE/SDVE Compliance Evaluation Form for every MBE, WBE, or SDVE subcontractor or material supplier the Bidder intends to use for the contract work. The Bidder is required to submit all appropriate MBE/WBE/SDVE documentation before the stated time and date set forth in the Invitation for Bid. If the Bidder fails to provide such information by the specified date and time, the Owner shall reject the bid.

3. The Director reserves the right to request additional information from a Bidder to clarify the Bidder's proposed MBE, WBE, and/or SDVE participation. The Bidder shall submit the clarifying information requested by the Owner within two (2) Working Days of receiving the request for clarification.

4. Pursuant to section 34.074, RSMo, a Bidder that is a SDVE doing business as Missouri firm, corporation, or individual, or that maintains a Missouri office or place of business, shall receive a three-point bonus preference in the contract award evaluation process. The bonus preference will be calculated and applied by reducing the bid amount of the eligible SDVE by three percent of the apparent low responsive bidder's bid. Based on this calculation, if the eligible SDVE's evaluation is less than the apparent low responsive bidder's bid, the eligible SDVE's bid becomes the apparent low responsive bid. This reduction is for evaluation purposes only, and will have no impact on the actual amount(s) of the bid or the amount(s) of any contract awarded. In order to be eligible for the SDVE preference, the Bidder must complete and submit with its bid the Missouri Service Disabled Veteran Business Form, and any information required by the form. The form is available on the MissouriBUYS solicitation for this project.

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

1. A Bidder who is a MBE, WBE, or SDVE may count 100% of the contract towards the MBE, WBE or SDVE goal, less any amounts awarded to another MBE, WBE or SDVE. (NOTE: A MBE firm that bids as general contractor must obtain WBE and SDVE participation; a WBE firm that bids as a general contractor must obtain MBE and SDVE participation; and a SDVE firm that bids as general contractor must obtain MBE and WBE participation.) In order for the remaining contract amount to be counted towards the MBE, WBE or SDVE goal, the Bidder must complete the MBE/WBE/SDVE Compliance Evaluation Form (Section 004337) identifying itself as an MBE, WBE or SDVE.

2. The total dollar value of the work granted to a certified MBE, WBE or SDVE by the Bidder shall be counted towards the applicable goal.

3. Expenditures for materials and supplies obtained from a certified MBE, WBE, or SDVE supplier or manufacturer may be counted towards the MBE, WBE and SDVE goals, if the MBE, WBE, or SDVE assumes the actual and contractual responsibility for the provision of the materials and supplies.

4. The total dollar value of the work granted to a second or subsequent tier subcontractor or a supplier may be counted towards a Bidder's MBE, WBE and SDVE goals, if the MBE, WBE, or SDVE properly assumes the actual and contractual responsibility for the work.

5. The total dollar value of work granted to a certified joint venture equal to the percentage of the ownership and control of the MBE, WBE, or SDVE partner in the joint venture may be counted towards the MBE/WBE/SDVE goals.

6. Only expenditures to a MBE, WBE, or SDVE that performs a commercially useful function in the work may be counted towards the MBE, WBE and SDVE goals. A MBE, WBE, or SDVE performs a commercially useful function when it is responsible for executing a distinct element of the work and carrying out its responsibilities by actually performing, managing and supervising the work or providing supplies or manufactured materials.

D. Certification of MBE/WBE/SDVE Subcontractors:

1. In order to be counted towards the goals, an MBE or WBE must be certified by the State of Missouri Office of Equal Opportunity and an SDVE must be certified by the State of Missouri, Office of Administration, Division of Purchasing and Material Management or by the Department of Veterans Affairs.

2. The Bidder may determine the certification status of a proposed MBE or WBE subcontractor or supplier by referring to the Office of Equal Opportunity (OEO)'s online MBE/WBE directory (https://apps1.mo.gov/MWBCertifiedFirms/). The Bidder may determine the eligibility of a SDVE subcontractor or supplier by referring to the Division of Purchasing and Materials Management's online SDVE directory (https://oeo.mo.gov/sdve-certification-program/) or the Department of Veterans Affairs' directory (https://veterans.certify.sba.gov/#search).

3. Additional information, clarifications, etc., regarding the listings in the directories may be obtained by calling the Division at (573)751-3339 and asking to speak to the Contract Specialist of record as shown in the Supplementary Conditions (Section 007300).

E. Waiver of MBE/WBE/SDVE Participation:

1. If a Bidder has made a good faith effort to secure the required MBE, WBE and/or SDVE participation and has failed, the Bidder shall submit with its bid the information requested in MBE/WBE/SDVE Good Faith Effort (GFE) Determination form. The GFE forms are located on the MissouriBUYS solicitation for this project. The Director will determine if the Bidder made a good faith effort to meet the applicable goals. If the Director determines that the Bidder did not make a good faith effort, the bid shall be rejected as being nonresponsive to the bid requirements. Bidders who demonstrate that they have made a good faith effort to include MBE, WBE, and/or SDVE participation will be determined to be responsive to the applicable participation goals, regardless of the percent of actual participation obtained, if the bid is otherwise acceptable.

2. In determining whether a Bidder has made a good faith effort to obtain MBE, WBE and/or SDVE participation, the Director may evaluate the factors set forth in 1 CSR 30-5.010(6)(C) and the following:
   a. The amount of actual participation obtained;
   b. How and when the Bidder contacted potential MBE, WBE, and SDVE subcontractors and suppliers;
   c. The documentation provided by the Bidder to support its contacts, including whether the Bidder provided the names, addresses, phone numbers, and dates of contact for MBE/WBE/SDVE firms contacted for specific categories of work;
   d. If project information, including plans and specifications, were provided to MBE/WBE/SDVE subcontractors;
   e. Whether the Bidder made any attempts to follow-up with MBE, WBE or SDVE firms prior to bid;
   f. Amount of bids received from any of the subcontractors and/or suppliers that the Bidder contacted;
   g. The Bidder's stated reasons for rejecting any bids;

3. If no bidder has obtained any participation in a particular category (MBE/WBE/SDVE) or made a good faith effort to do so, the Director may waive that goal rather than rebid.

F. Contractor MBE/WBE/SDVE Obligations

1. If awarded a contract, the Bidder will be contractually required to subcontract with or obtain materials from the MBE, WBE, and SDVE firms listed in its bid, in amounts equal to or greater than the dollar amount bid, unless the amount is modified in writing by the Owner.

2. If the Contractor fails to meet or maintain the participation requirements contained in the Contractor's bid, the Contractor must satisfactorily explain to the Director why it cannot comply with the requirement and why failing meeting the requirement was beyond the Contractor's control. If the Director finds the Contractor's explanation unsatisfactory, the Director may take any appropriate action including, but not limited to:

    a. Declaring the Contractor ineligible to participate in any contracts with the Division for up to twelve (12) months (suspension); and/or

    b. Declaring the Contractor be non-responsive to the Invitation for Bid, or in breach of contract and rejecting the bid or terminating the contract.

3. If the Contractor replaces an MBE, WBE, or SDVE during the course of this contract, the Contractor shall replace it with another MBE, WBE, or SDVE or make a good faith effort to do so. All MBE, WBE and SDVE substitutions must be approved by the Director.

4. The Contractor shall provide the Owner with regular reports on its progress in meeting its MBE/WBE/SDVE obligations. At a minimum, the Contractor shall report the dollar-value of work completed by each MBE, WBE, or SDVE during the preceding month and the cumulative total of work completed by each MBE, WBE or SDVE to date with each monthly application for payment. The Contractor shall also make a final report, which shall include the total dollar-value of work completed by each MBE, WBE, and SDVE during the entire contract.

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

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

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

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

https://oeo.mo.gov/sdve-certification-program/

https://veterans.certify.sba.gov/#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 the Department of Public Safety/National Guard (MONG).

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:	**Connect Camp Clark Sewer System to City of Nevada Sewer System** **Camp Clark Training Site** **Nevada, Missouri**
Project Number:	**T2301-02**

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

ARTICLE 3. LIQUIDATED DAMAGES

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

ARTICLE 4. CONTRACT SUM

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

Base Bid: $

TOTAL CONTRACT AMOUNT: ($CONTRACT AMOUNT)

UNIT PRICES: The Owner accepts the following Unit Prices:

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

ARTICLE 5. PREVAILING WAGE RATE

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

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

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

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

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

Total $

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

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

ARTICLE 7. CONTRACT DOCUMENTS

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

1. Division 0 – Procurement and Contracting Information, including, but not limited to:
    a. Invitation for Bid (Section 001116)
    b. Instructions to Bidders (Section 002113)
    c. Supplementary Instructions to Bidders (if applicable) (Section 002213)
    d. The following documents as completed and executed by the Contractor and accepted by the Owner, if applicable:

i. Bid Form (Section 004113)
ii. Unit Prices (Section 004322)
iii. Proposed Contractors Form (Section 004336)
iv. MBE, WBE, SDVE Compliance Evaluation Form(s) (Section 004337)
v. MBE, WBE, SDVE Eligibility Determination Form for Joint Ventures (Section 004338)
vi. MBE, WBE, SDVE Good Faith Effort (GFE) Determination Form (Section 004339)
vii. Missouri Service Disabled Veteran Business Form (Section 004340)
viii. Affidavit of Work Authorization (Section 004541)
ix. Affidavit for Affirmative Action (Section 005414)

e. Performance and Payment Bond, completed and executed by the Contractor and surety (Section 006113)
f. General Conditions (Section 007213)
g. Supplementary Conditions (Section 007300)
h. Supplementary General Conditions for Federally Funded/Assisted Construction Projects (Section 007333)
i. Wage Rate(s) (Section 007346)

2. Division 1 – General Requirements
3. All Drawings identified in the Project Manual
4. All Technical Specifications included in the Project Manual
5. Addenda, if applicable

ARTICLE 8 – CERTIFICATION

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

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

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

APPROVED:

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

_____
Contractor's Authorized Signature

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

_____
Corporate Secretary

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

AFFIDAVIT FOR AFFIRMATIVE ACTION

PROJECT NUMBER

NAME

First being duly sworn on oath states: that

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

NAME

a ☐ sole proprietorship ☐ partnership ☐ limited liability company (LLC)

or ☐ corporation, and as such, said proprietor, partner, or officer is duly authorized to make this affidavit on behalf of said sole proprietorship, partnership, or corporation; that under the contract known as

PROJECT TITLE

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

PRINT NAME & SIGNATURE	DATE

NOTARY INFORMATION

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

MO 300-1401 (05/18) FILE/Construction Contract

Bond No._____

SECTION 006113 - PERFORMANCE AND PAYMENT BOND FORM

KNOW ALL MEN BY THESE PRESENTS, THAT we _____

as principal, and _____

_____as Surety, are held and firmly bound unto the

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

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

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

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

_____

_____

_____

(Insert Project Title and Number)

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

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

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

AS APPLICABLE:

AN INDIVIDUAL

Name: _____

Signature: _____

A PARTNERSHIP

Name of Partner: _____

Signature of Partner: _____

Name of Partner: _____

Signature of Partner: _____

CORPORATION

Firm Name: _____

Signature of President: _____

SURETY

Surety Name: _____

Attorney-in-Fact: _____

Address of Attorney-in-Fact: _____

_____

Telephone Number of Attorney-in-Fact: _____

Signature Attorney-in-Fact: _____

NOTE: Surety shall attach Power of Attorney

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

PRODUCT SUBSTITUTION REQUEST

PROJECT NUMBER

PROJECT TITLE AND LOCATION

CHECK APPROPRIATE BOX

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

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

FROM: BIDDER/CONTRACTOR (PRINT COMPANY NAME)

TO: ARCHITECT/ENGINEER (PRINT COMPANY NAME)

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

SPECIFIED PRODUCT OR SYSTEM

SPECIFICATION SECTION NO.

SUPPORTING DATA

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

☐ Sample ☐ Sample will be sent, if requested

QUALITY COMPARISON

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

PREVIOUS INSTALLATIONS

PROJECT	ARCHITECT/ENGINEER	
LOCATION		DATE INSTALLED

SIGNIFICANT VARIATIONS FROM SPECIFIED PRODUCT

REASON FOR SUBSTITUTION

DOES PROPOSED SUBSTITUTION AFFECT OTHER PARTS OF WORK?

☐ YES ☐ NO

IF YES, EXPLAIN

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

☐ YES ☐ NO

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

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

BIDDER/CONTRACTOR	DATE

REVIEW AND ACTION

☐ Resubmit Substitution Request with the following additional information:

☐ Substitution is accepted.

☐ Substitution is accepted with the following comments:

☐ Substitution is not accepted.

ARCHITECT/ENGINEER	DATE

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

FINAL RECEIPT OF PAYMENT AND RELEASE

PROJECT NUMBER

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

(PROJECT TITLE, PROJECT LOCATION, AND PROJECT NUMBER)

at

(ADDRESS OF PROJECT)

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

DOES HEREBY:

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

DATED this day of , 20 .

NAME OF SUBCONTRACTOR

BY (TYPED OR PRINTED NAME)

SIGNATURE

TITLE

ORIGINAL: FILE/Closeout Documents

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

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

MBE/WBE/SDVE PROGRESS REPORT

Remit with **ALL** Progress and Final Payments

(Please check appropriate box) ☐CONSULTANT ☐CONSTRUCTION

PROJECT TITLE	
PROJECT LOCATION	
FIRM	
ORIGINAL CONTRACT SUM (Same as Line Item 1. on Form A of Application for Payment) **$**	TOTAL CONTRACT SUM TO DATE (Same as Line Item 3. on Form A of Application for Payment) **$**

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

SELECT MBE, WBE, SDVE	ORIGINAL CONTRACT PARTICIPATION AMOUNT	PARTICIPATION AMOUNT PAID-TO-DATE (includes approved contract changes)	CONSULTANT/SUBCONSULTANT OR CONTRACTOR/SUBCONTRACTOR/SUPPLIER COMPANY NAME
☐ MBE ☐ WBE ☐ SDVE	$	$	
☐ MBE ☐ WBE ☐ SDVE	$	$	
☐ MBE ☐ WBE ☐ SDVE	$	$	
☐ MBE ☐ WBE ☐ SDVE	$	$	
☐ MBE ☐ WBE ☐ SDVE	$	$	
☐ MBE ☐ WBE ☐ SDVE	$	$	

Revised 05/21

INSTRUCTIONS FOR MBE/WBE/SDVE PROGRESS REPORT

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

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

At Initial Pay Application fill in the following:

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

For all subsequent Pay Applications fill in the following:

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

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

PROJECT NUMBER

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

State of _____ personally came and appeared _____
(NAME)

_____ of the _____
(POSITION) (NAME OF THE COMPANY)

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

Located at _____ in _____ County
(NAME OF THE INSTITUTION)

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

SIGNATURE

NOTARY INFORMATION

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

FILE: Closeout Documents

GENERAL CONDITIONS

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SECTION 007213 - GENERAL CONDITIONS

A. These General Conditions apply to each section of these specifications. The Contractor is subject to the provisions contained herein.

B. The General Conditions are intended to define the relationship of the Owner, the Designer and the Contractor thereby establishing certain rules and provisions governing the operation and performance of the work so that the work may be performed in a safe, orderly, expeditious and workmanlike manner.

ARTICLE 1 – GENERAL PROVISIONS

ARTICLE 1.1 - DEFINITIONS

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

1. **"COMMISSIONER":** The Commissioner of the Office of Administration.
2. **"CONSTRUCTION DOCUMENTS":** The "Construction Documents" shall consist of the Project Manual, Drawings and Addenda.
3. **"CONSTRUCTION REPRESENTATIVE:"** Whenever the term "Construction Representative" is used, it shall mean the Owner's Representative at the work site.
4. **"CONTRACTOR"**: Party or parties who have entered into a contract with the Owner to furnish work under these specifications and drawings.
5. **"DESIGNER"**: When the term "Designer" is used herein, it shall refer to the Architect, Engineer, or Consultant of Record specified and defined in Paragraph 2.0 of the Supplemental Conditions, or his duly authorized representative. The Designer may be either a consultant or state employee.
6. **"DIRECTOR"**: Whenever the term "Director" is used, it shall mean the Director of the Division of Facilities Management, Design and Construction or his Designee, representing the Office of Administration, State of Missouri. The Director is the agent of the Owner.
7. **"DIVISION":** Shall mean the Division of Facilities Management, Design and Construction, State of Missouri.
8. **"INCIDENTAL JOB BURDENS":** Shall mean those expenses relating to the cost of work, incurred either in the home office or on the job-site, which are necessary in the course of doing business but are incidental to the job. Such costs include office supplies and equipment, postage, courier services, telephone expenses including long distance, water and ice and other similar expenses.
9. **"JOINT VENTURE"**: An association of two (2) or more businesses to carry out a single business enterprise for profit for which purpose they combine their property, capital, efforts, skills and knowledge.
10. **"OWNER"**: Whenever the term "Owner" is used, it shall mean the State of Missouri, acting by and through the Office of Administration, Division of Facilities Management, Design and Construction.
11. **"PROJECT"**: Wherever the term "Project" is used, it shall mean the work required to be completed by the construction contract.
12. **"PROJECT MANUAL"**: The "Project Manual" shall consist of Introductory Information, Invitation for Bid, Instructions to Bidders, Bid Documents, Additional Information, Standard Forms, General Conditions, Supplemental General Conditions, General Requirements and Technical Specifications.
13. **"SUBCONTRACTOR"**: Party or parties who contract under, or for the performance of part or this entire Contract between the Owner and Contractor. The subcontract may or may not be direct with the Contractor.
14. **"WORK"**: All supervision, labor, materials, tool, supplies, equipment, and any incidental operations and/or activities required by or reasonably inferable from the Contract Documents necessary to construct the Project and to produce the results intended by the Contract Documents in a safe, expeditious, orderly, and workmanlike manner, and in the best manner known to each respective trade.
15. "**WORKING DAYS**": are all calendar days except Saturdays, Sundays and the following holidays: New Year's Day, Martin Luther King, Jr. Day, Lincoln Day, Washington's Birthday (observed), Truman Day, Memorial Day, Juneteenth, Independence Day, Labor Day, Columbus Day, Veterans Day (observed), Thanksgiving Day, Christmas Day.

ARTICLE 1.2 DRAWINGS AND SPECIFICATIONS

A. In case of discrepancy between drawings and specifications, specifications shall govern. Should discrepancies in architectural drawings, structural drawings and mechanical drawings occur, architectural drawings shall govern and, in case of conflict between structural and mechanical drawings, structural drawings shall govern.

B. Specifications are separated into titled divisions for convenience of reference only and to facilitate letting of contracts and subcontracts. The Contractor is responsible for establishing the scope of work for subcontractors, which may cross titled divisions. Neither the Owner nor Designer will establish limits and jurisdiction of subcontracts.

C. Figured dimensions take precedence over scaled measurements and details over smaller scale general drawings. In the event of conflict between any of the documents contained within the contract, the documents shall take precedence and be controlling in the following sequence: addenda, supplementary general conditions, general conditions, division 1 specifications, technical division specifications, drawings, bid form and instructions to bidders.

D. Anything shown on drawings and not mentioned in these specifications or vice versa, as well as any incidental work which is obviously necessary to complete the project within the limits established by the drawings and specifications, although not shown on or described therein, shall be performed by the Contractor at no additional cost as a part of his contract.

E. Upon encountering conditions differing materially from those indicated in the contract documents, the Contractor shall promptly notify the Designer and Construction Representative in writing before such conditions are disturbed. The Designer shall promptly investigate said conditions and report to the Owner, with a recommended course of action**.** If conditions do materially differ and cause an increase or decrease in contract cost or time required for completion of any portion of the work, a contract change will be initiated as outlined in Article 4 of these General Conditions.

E. Only work included in the contract documents is authorized, and the Contractor shall do no work other than that described therein or in accordance with appropriately authorized and approved contract changes.

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

A. Since the Owner is the State of Missouri, municipal or political subdivisions, zoning ordinances, construction codes (other than licensing of trades), and other like ordinances are not applicable to construction on Owner's property, and Contractor will not be required to submit drawings and specifications to any municipal or political subdivision, authority, obtain construction permits or any other licenses (other than licensing of trades) or permits from or submit to inspections by any municipality or political subdivision relating to the construction for this project. All permits or licenses required by municipality or political subdivision for operation on property not belonging to Owner shall be obtained by and paid for by Contractor. Each Contractor shall comply with all applicable laws, ordinances, rules and regulations that pertain to the work of this contract.

B. Contractors, subcontractors and their employees engaged in the businesses of electrical, mechanical, plumbing, carpentry, sprinkler system work, and other construction related trades shall be licensed to perform such work by the municipal or political subdivision where the project is located, if such licensure is required by local code. Local codes shall dictate the level (master, journeyman, and apprentice) and the number, type and ratio of licensed tradesmen required for this project within the jurisdiction of such municipal or political subdivision.

C. Equipment and controls manufacturers and their authorized service and installation technicians that do not maintain an office within the jurisdiction of the municipal or political subdivision but are a listed or specified contractor or subcontractor on this project are exempt from Paragraph 1.3 B above.

D. The Contractor shall post a copy of the wage determination issued for the project and included as a part of the contract documents, in a prominent and easily accessible location at the site of construction for the duration of the project.

E. Any contractor or subcontractor to such contractor at any tier signing a contract to work on this project shall provide a ten-hour Occupational Safety and Health Administration (OSHA) construction safety program for their on-site employees which includes a course in construction safety and health approved by OSHA or a similar program approved by the Department of Labor and Industrial Relations which is at least as stringent as an approved OSHA program. The contractor shall

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

ARTICLE 1.4 - NONDISCRIMINATION IN EMPLOYMENT

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

1. Against recipients of service on the basis of race, color, religion, national origin, sex, disability or age.

2. Against any employee or applicant, for employment on the basis of race, color, religion, national origin, sex or otherwise qualified disability status.

3. Against any applicant for employment or employee on the basis of age, where such applicant or employee is between ages 40 and 70 and where such Contractor employs at least 20 persons.

4. Against any applicant for employment or employee on the basis of that person's status as a disabled or Vietnam-era veteran.

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

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

1. A written policy statement committing the total organization to affirmative action and assigning management responsibilities and procedures for evaluation and dissemination;

2. The identification of a person designated to handle affirmative action;

3. The establishment of non-discriminatory selection standards, objective measures to analyze recruitment, an upward mobility system, a wage and salary structure, and standards applicable to lay-off, recall, discharge, demotion and discipline;

4. The exclusion of discrimination from all collective bargaining agreements; and

5. Performance of an internal audit of the reporting system to monitor execution and to provide for future planning.

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

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

ARTICLE 1.5 - ANTI-KICKBACK

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

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

ARTICLE 1.6 - PATENTS AND ROYALTIES

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

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

ARTICLE 1.7 - PREFERENCE FOR AMERICAN AND MISSOURI PRODUCTS AND SERVICES

A. By virtue of statutory authority a preference will be given to Missouri labor and to products of mines, forests and quarries of the state of Missouri when they are found in marketable quantities in the state, and all such materials shall be of the best quality and suitable character that can be obtained at reasonable market prices, all as provided for in Section 8.280, Missouri Revised Statutes and Cumulative Supplements.

B. Furthermore, pursuant to Section 34.076 Missouri Revised Statutes and Cumulative Supplements, a preference shall be given to those persons doing business as Missouri firms, corporations, or individuals, or which maintain Missouri offices or places of business, when the quality of performance promised is equal or better and the price quoted is the same or less. In addition, in order for a non-domiciliary bidder to be successful, his bid must be that same percentage lower than a domiciliary Missouri bidder's bid, as would be required for a Missouri bidder to successfully bid in the non-domiciliary state.

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

ARTICLE 1.8 - COMMUNICATIONS

A. All notices, requests, instructions, approvals and claims must be in writing and shall be delivered to the Designer and copied to the Construction Representative for the project except as required by Article 1.12 Disputes and Disagreements, or as otherwise specified by the Owner in writing as stated in Section 012600. Any such notice shall be deemed to have been given as of the time of actual receipt.

B. The Contractor shall attend on-site progress and coordination meetings, as scheduled by the Construction Representative, no less than once a month.

C. The Contractor shall ensure that major subcontractors and suppliers shall attend monthly progress meetings as necessary to coordinate the work, and as specifically requested by the Construction Representative.

ARTICLE 1.9 - SEPARATE CONTRACTS AND COOPERATION

A. The Owner reserves the right to let other contracts in connection with this work. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work and shall properly connect and coordinate his work with theirs.

B. The Contractor shall consult the drawings for all other contractors in connection with this work. Any work conflicting with the above shall be brought to the attention of the Owner’s Representative before the work is performed. If the Contractor fails to do this, and constructs any

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

C. Each contractor shall be required to coordinate his work with other contractors so as to afford others reasonable opportunity for execution of their work. No contractor shall delay any other contractor by neglecting to perform contract work at the proper time. If any contractor causes delay to another, they shall be liable directly to that contractor for such delay in addition to any liquidated damages which might be due the Owner.

D. Should the Contractor or project associated subcontractors refuse to cooperate with the instructions and reasonable requests of other Contractors or other subcontractors in the overall coordinating of the work, the Owner may take such appropriate action and issue directions, as required, to avoid unnecessary and unwarranted delays.

E. Each Contractor shall be responsible for damage done to Owner's or other Contractor's property by him/her or workers in his employ through their fault or negligence.

F. Should a Contractor sustain any damage through any act or omission of any other Contractor having a contract with the Owner, the Contractor so damaged shall have no claim or cause of action against the Owner for such damage, but shall have a claim or cause of action against the other Contractor to recover any and all damages sustained by reason of the acts or omissions of such Contractor. The phrase "acts or omissions" as used in this section shall be defined to include, but not be limited to, any unreasonable delay on the part of any such contractors.

ARTICLE 1.10 - ASSIGNMENT OF CONTRACT

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

ARTICLE 1.11 - INDEMNIFICATION

A. Contractor agrees to indemnify and save harmless Owner and its respective commissioners, officers, officials, agents, consultants and employees and Designer, their agents, servants and employees, from and against any and all liability for damage arising from injuries to persons or damage to property occasioned by any acts or omissions of Contractor, any subcontractors, agents, servants or employees, including any and all expense, legal or otherwise, which may be incurred by Owner or Designer, its agents, servants or employees, in defense of any claim, action or suit.

B. The obligations of the Contractor under this paragraph shall not extend to the liability of the Designer, his agents or employees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, contract changes, design or specifications, or (2) giving of or the failure to give directions or instructions by the Designer, his agents or employees as required by this contract documents provided such giving or failure to give is the primary cause of the injury or damage.

ARTICLE 1.12 - DISPUTES AND DISAGREEMENTS

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

ARTICLE 2 -- OWNER/DESIGNER RESPONSIBILITIES

A. The Owner shall give all orders and directions contemplated under this contract relative to the execution of the work. During progress of work the Owner will be represented at the project site by the Construction Representative and/or Designer, whose responsibilities are to see that this contract is properly fulfilled.

B. The Owner shall at all times have access to the work whenever it is in preparation or progress. The Contractors shall provide proper facilities for such access and for inspection and supervision.

C. All materials and workmanship used in the work shall be subject to the inspection of the Designer and Construction Representative, and any work which is deemed defective shall be removed, rebuilt or made good immediately upon notice.

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

D. If the Contractor fails to proceed at once with the correction of rejected defective materials or workmanship, the Owner may, by separate contract or otherwise, have the defects remedied or rejected. Materials removed from the site and charge the cost of the same against any monies which may be due the Contractor, without prejudice to any other rights or remedies of the Owner.

E. Failure or neglect on the part of Owner to observe faulty work, or work done which is not in accordance with the drawings and specifications shall not relieve the Contractor from responsibility for correcting such work without additional compensation.

F. The Owner shall have the right to direct the Contractor to uncover any completed work.

1. If the Contractor fails to adequately notify the Construction Representative and/or Designer of an inspection as required by the Contract Documents, the Contractor shall, upon written request, uncover the work. The Contractor shall bear all costs associated with uncovering and again covering the work exposed.

2. If the Contractor is directed to uncover work, which was not otherwise required by the Contract Documents to be inspected, and the work is found to be defective in any respect, no compensation shall be allowed for this work. If, however, such work is found to meet the requirements of this contract, the actual cost of labor and material necessarily involved in the examination and replacement plus 10% shall be allowed the Contractor.

G. The Designer shall give all orders and directions contemplated under this contract relative to the scope of the work and shall give the initial interpretation of the contract documents.

H. The Owner may file a written notice to the Contractor to dismiss immediately any subcontractors, project managers, superintendents, foremen, workers, watchmen or other employees whom the Owner may deem incompetent, careless or a hindrance to proper or timely execution of the work. The Contractor shall comply with such notice as promptly as practicable without detriment to the work or its progress.

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

ARTICLE 3 -- CONTRACTOR RESPONSIBILITIES

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

ARTICLE 3.1 -- ACCEPTABLE SUBSTITUTIONS

A. The Contractor may request use of any article, device, product, material, fixture, form or type of construction which in the judgment of the Owner and Designer is equal in all respects to that named. Standard products of manufacturers other than those specified will be accepted when, prior to the ordering or use thereof, it is proven to the satisfaction of the Owner and Designer that they are equal in design, strength, durability, usefulness and convenience for the purpose intended.

B. Any changes required in the details and dimensions indicated on the drawings for the substitution of products other than those specified shall be properly made at the expense of the Contractor requesting the substitution or change.

C. The Contractor shall submit a request for such substitutions in writing to the Owner and Designer within twenty (20) working days after the date of the "Notice to Proceed." Thereafter no consideration will be given to alternate forms of accomplishing the work. This Article does not preclude the Owner from exercising the provisions of Article 4 hereof.

D. Any request for substitution by the Contractor shall be submitted in accordance with SECTION 002113 - INSTRUCTIONS TO BIDDERS.

E. When a material has been approved, no change in brand or make will be permitted unless:

1. Written verification is received from the manufacturer stating they cannot make delivery on the date previously agreed, or

2. Material delivered fails to comply with contract requirements.

ARTICLE 3.2 -- SUBMITTALS

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

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

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

B. All subcontractors' shop drawings and schedules shall be submitted by the Contractor and shall bear evidence that Contractor has received, reviewed, and approved them. Any shop drawings and schedules submitted without this evidence will be returned to the Contractor for resubmission.

C. The Contractor shall include with the shop drawing, a letter indicating any and all deviations from the drawings and/or specifications. Failure to notify the Designer of such deviations will be grounds for subsequent rejection of the related work or materials. If, in the opinion of the Designer, the deviations are not acceptable, the Contractor will be required to furnish the item as specified and indicated on the drawings.

D. The Designer shall check shop drawings and schedules with reasonable promptness and approve them only if they conform to the design concept of the project and comply with the information given in the contract documents. The approval shall not relieve the Contractor from the responsibility to comply with the drawings and specifications, unless the Contractor has called the Designer's attention to the deviation, in writing, at the time of submission and the Designer has knowingly approved thereof. An approval of any such modification will be given only under the following conditions:

   1. It is in the best interest of the Owner
   2. It does not increase the contract sum and/or completion time
   3. It does not deviate from the design intent
   4. It is without prejudice to any and all rights under the surety bond.

E. No extension of time will be granted because of the Contractor's failure to submit shop drawings and schedules in ample time to allow for review, possible resubmission, and approval. Fabrication of work shall not commence until the Contractor has received approval. The Contractor shall furnish prints of approved shop drawings and schedules to all subcontractors whose work is in any way related to the work under this contract. Only prints bearing this approval will be allowed on the site of construction

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

ARTICLE 3.3 – AS-BUILT DRAWINGS

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

ARTICLE 3.4 – GUARANTY AND WARRANTIES

A. General Guaranty

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

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

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

B. Extended Warranty

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

ARTICLE 3.5 -- OPERATION AND MAINTENANCE MANUALS

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

1. Start-up and Shut-down Procedures: Provide a step-by-step write up of all major equipment. When manufacturer's printed start-up, trouble shooting and shut-down procedures are available; they may be incorporated into the operating manual for reference.

2. Operating Instructions: Written operating instructions shall be included for the efficient and safe operation of all equipment.

3. Equipment List: List of all major equipment as installed shall be prepared to include model number, capacities, flow rate, name place data, shop drawings and air and water balance reports.

4. Service Instructions: Provide the following information for all pieces of equipment.

   a. Recommended spare parts including catalog number and name of local supplier or factory representative.

   b. Belt sizes, types, and lengths.

   c. Wiring diagrams.

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

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

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

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

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

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

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

ARTICLE 3.6 – OTHER CONTRACTOR RESPONSIBILITIES

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

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

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

C. The Contractor shall supply sufficient labor, material, plant and equipment and pay when due any laborer, subcontractor or supplier for supplies furnished and otherwise prosecute the work with diligence to prevent work stoppage and insure completion thereof within the time specified.

D. The Contractor and each of his subcontractors shall submit to the Construction Representative, through the Designer such schedules of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data as the Owner may request concerning work performed or to be performed under this contract.

E. The Contractor, subcontractors, and material suppliers shall upon written request, give the Owner access to all time cards, material invoices, payrolls, estimates, profit and loss statements, and all other direct or indirect costs related to this work.

F. The Contractor shall be responsible for laying out all contract work such as layout of architectural, structural, mechanical and electrical work, which shall be coordinated with layouts of subcontractors for general construction work. The Contractor is also responsible for unloading, uncrating and handling of all materials and equipment to be erected or placed by him/her, whether furnished by Contractor or others. No extra charges or compensation will be allowed as a result of failure to verify dimensions before ordering materials or fabricating items.

G. The Contractor must notify the Construction Representative at least one working day before placing concrete or burying underground utilities, pipelines, etc.

H. Contractors shall prearrange time with the Construction Representative for the interruption of any facility operation. Unless otherwise specified in these documents, all connections, alterations or relocations as well as all other portions of the work will be performed during normal working hours.

I. The Contractor shall coordinate all work so there will not be prolonged interruptions of existing equipment operation. Any existing plumbing, heating, ventilating, air conditioning or electrical disconnections necessary for the project, which affect portions of this construction or building or any other building must be scheduled with the Construction Representative to minimize or avoid any disruption of facility operations. In no case, unless previously approved in writing by the Construction Representative, shall utilities be left disconnected at the end of a work day or over a weekend. Any interruption of utilities either intentionally or accidentally shall not relieve the Contractor responsible for the interruption from the responsibility to repair and restore the utility to normal service. Repairs and restoration shall be made before the workers responsible for the repair and restoration leave the job.

J. Contractors shall limit operations and storage of materials to the area within the project, except as necessary to connect to existing utilities, and shall not encroach on neighboring property. The Contractor shall be responsible for repair of their damage to property on or off the project site occurring during construction of project. All such repairs shall be made to the satisfaction of the property owner.

K. Unless otherwise permitted, all materials shall be new and both workmanship and materials shall be of the best quality.

L. Unless otherwise provided and stipulated within these specifications, the Contractor shall furnish, construct, and/or install and pay for materials, devices, mechanisms, equipment, all necessary personnel, utilities including, but not limited to water, heat, light and electric power, transportation services, applicable taxes of every nature, and all other facilities necessary for the proper execution and completion of the work.

M. Contractor shall carefully examine the plans and drawings and shall be responsible for the proper fitting of his material, equipment and apparatus into the building.

N. The Contractor or subcontractors shall not overload, or permit others to overload, any part of any structure during the performance of this contract.

O. All temporary shoring, bracing, etc., required for the removal of existing work and/or for the installation of new work shall be included in this contract. The Contractor shall make good, at no cost to the Owner, any damage caused by improper support or failure of shoring in any respect. Each Contractor shall be responsible for shoring required to protect his work or adjacent property and improvements of Owner and shall be responsible for shoring or for giving written notice to adjacent property owners. Shoring shall be removed only after completion of permanent supports.

P. The Contractor shall provide at the proper time such material as is required for support of the work. If openings are required, whether shown on drawings or not, the Contractor shall see that they are properly constructed.

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

R. The Contractor shall be responsible for protection, including weather protection, and proper maintenance of all equipment and materials.

S. The Contractor shall be responsible for care of the finished work and shall protect same from damage or defacement until substantial completion by the Owner. If the work is damaged by any cause, the Contractor shall immediately begin to make repairs in accordance with the drawings and specifications. Contractor shall be liable for all damage or loss unless attributable to the acts or omissions of the Owner or Designer. Any claim for reimbursement shall be submitted in accordance with Article 4. After substantial completion the Contractor will only be responsible for damage resulting from acts or omissions of the Contractor or subcontractors through final warranty.

T. In the event the Contractor encounters an unforeseen hazardous material, the Contractor shall immediately stop work in the area affected and report the condition to the Owner and Designer in writing. The Contractor shall not be required, pursuant to Article 4, to perform, any work relating to hazardous materials.

U. In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 4.

V. Before commencing work, Contractors shall confer with the Construction Representative and facility representative and review any facility rules and regulations which may affect the conduct of the work.

W. Project signs will only be erected on major projects and only as described in the specifications. If no sign is specified, none shall be erected.

ARTICLE 3.7 -- SUBCONTRACTS

A. Subcontractor assignments as identified in the bid form shall not be changed without written approval of the Owner. The Owner will not approve changes of a listed subcontractor unless the Contractor documents, to the satisfaction of the Owner that the subcontractor cannot or will not perform the work as specified.

B. The Contractor is fully responsible to the Owner for the acts and omissions of all subcontractors and of persons either directly or indirectly employed by them.

C. Every subcontractor shall be bound by the applicable terms and provisions of these contract documents, but no contractual relationship shall exist between any subcontractor and the Owner unless the right of the Contractor to proceed with the work is suspended or this contract is terminated as herein provided, and the Owner in writing elects to assume the subcontract.

D. The Contractor shall upon receipt of "Notice to Proceed" and prior to submission of the first payment request, notify the Designer and Construction Representative in writing of the names of any subcontractors to be used in addition to those identified in the bid form and all major material suppliers proposed for all parts of the work.

ARTICLE 4 -- CHANGES IN THE WORK

4.1 CHANGES IN THE WORK

A. The Construction Representative, without giving notice to the surety and without invalidating this contract, may order extra work or make changes by altering, adding to or deducting from the work, this contract sum being adjusted accordingly. All such work shall be executed under the conditions of the original contract. A claim for extension of time caused by any change must be adjusted at the time of ordering such change. No future request for time will be considered.

B. Each Contract Change shall include all costs required to perform the work including all labor, material, equipment, overheads and profit, delay, disruptions, or other miscellaneous expenses. No subsequent requests for additional compensation including claims for delay, disruption, or reduced efficiency as a result of each change will be considered. Values from the Schedule of Values will not be binding as a basis for additions to or deductions from the contract price.

C. The amount of any adjustment in this contract price for authorized changes shall be agreed upon

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

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

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

1. The overhead and profit charge by the Contractor and all subcontractors shall be considered to include, but is not limited to: incidental job burdens, small truck (under 1 ton) expense, mileage, small hand tools, warranty costs, company benefits and general office overhead. Project supervision including field supervision and job site office expense shall be considered a part of overhead and profit unless a compensable time extension is granted.
2. The percentages for overhead and profit charged on Contract Changes shall be subject to the following limits: (a) the percentage mark-up for the Contractor shall be limited to the Contractor's fee; (b) fifteen percent (15%) maximum for Work directly performed by employees of a subcontractor, or sub-subcontractor; (c) five percent (5%) maximum for the Work performed or passed through to the Owner by the Contractor; (d) five percent (5%) maximum subcontractor's mark-up for Work performed by a sub-subcontractor and passed through to the Owner by the subcontractor and Contractor; and (e) in no case shall the total overhead and profit paid by the Owner on any Contract Changes exceed twenty-five percent (25%) of the cost of materials, labor and equipment (exclusive of Contractor or any Subcontractor overhead and profit) necessary to put the contract change work in place.
3. The Contractor will be allowed to add the cost of Contractor's payment and performance bonding, builder's risk insurance, and general liability insurance to their cost of work. The above listed bonding and insurance cost shall not exceed 2% and shall be allowed on the total cost of the added work, including overhead and profit.
4. On proposals covering both increases and decreases in the amount of this contract, the application of overhead and profit shall be on the net change in the cost of the work.
5. The percentage(s) for overhead and profit to be credited to the Owner on Contract Changes that are solely decreases in the quantity of work or materials shall be the same as those for additive Contract Changes provided above.

E. No claim for an addition to this contract sum shall be valid unless authorized as aforesaid in writing by the Owner. In the event that none of the foregoing methods are agreed upon, the Owner may order the Contractor to perform work on a time and material basis. The cost of such work shall be determined by the Contractor's actual labor and material cost to perform the work plus overhead and profit as outlined herein. The Designer and Construction Representative shall approve the Contractor's daily time and material invoices for the work involved.

F. If the Contractor claims that any instructions involve extra cost under this contract, the Contractor shall give the Owner's Representative written notice thereof within a reasonable time after the receipt of such instructions, and in any event before proceeding to execute the work. No such claim shall be valid unless so made and authorized by the Owner, in writing.

G. In an emergency affecting the safety of life or of the structure or of adjoining property, the Contractor, without special instruction or authorization from the Construction Representative, is hereby permitted to act at their discretion to prevent such threatened loss or injury. The Contractor shall submit a claim for

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

ARTICLE 4.2 – CHANGES IN COMPLETION TIME

A. Extension of the number of work days stipulated in the Contract for completion of the work with compensation may be made when:

1. The contractor documents that proposed Changes in the work, as provided in Article 4.1, extends construction activities critical to contract completion date, OR
2. The Owner suspends all work for convenience of the Owner as provided in Article 7.3, OR
3. An Owner caused delay extends construction activities critical to contract completion (except as provided elsewhere in these General Conditions). The Contractor is to review the work activities yet to begin and evaluate the possibility of rescheduling the work to minimize the overall project delay.

B. Extension of the number of work days stipulated in the Contract for completion of the work without compensation may be made when:

1. Weather-related delays occur, subject to provisions for the inclusion of a specified number of "bad weather" days when provided for in Section 012100-Allowances, OR
2. Labor strikes or acts of God occur, OR
3. The work of the Contractor is delayed on account of conditions which were beyond the control of the Contractor, subcontractors or suppliers, and were not the result of their fault or negligence.

C. No time extension or compensation will be provided for delays caused by or within the control of the Contractor, subcontractors or suppliers and for concurrent delays caused by the Owner.

D. The Contractor shall notify the Owner promptly of any occurrence or conditions which in the Contractor's opinion results in a need for an extension of time. The notice shall be in writing and shall include all necessary supporting materials with details of any resultant costs and be submitted in time to permit full investigation and evaluation of the Contractor's claim. The Owner shall promptly acknowledge the Contractor's notice and, after recommendation from the Owner's Representative and/or Designer, shall provide a decision to the Contractor. Failure on the part of the Contractor to provide such notice and to detail the costs shall constitute a waiver by the Contractor of any claim. Requests for extensions of time shall be for working days only.

ARTICLE 5 - CONSTRUCTION AND COMPLETION

ARTICLE 5.1 – CONSTRUCTION COMMENCEMENT

A. Upon receipt of the "Intent to Award" letter, the Contractor must submit the following properly executed instruments to the Owner:

1. Contract;
2. Performance/payment bond as described in Article 6.1;
3. Certificates of Insurance, or the actual policies themselves, showing that the Contractor has obtained the insurance coverage required by Article 6.2.
4. Written Affirmative Action Plans as required in Article 1.4.

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

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

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

ARTICLE 5.2 -- PROJECT CONSTRUCTION

A. Each Contractor shall submit for the Owner's approval, in reproducible form, a progress schedule showing the rate of progress and the order of the work proposed to carry on various phases of the project. The schedule shall be in conformance with the requirements outlined in Section 013200 – Schedules.

B. Contractor shall employ and supply a sufficient force of workers, material, and equipment and shall pay when due, any worker, subcontractor or supplier and otherwise prosecute the work with such diligence so as to maintain the rate of progress indicated on the progress schedule, prevent work stoppage, and insure completion of the project within the time specified.

ARTICLE 5.3 -- PROJECT COMPLETION

A. Substantial Completion. A Project is substantially complete when construction is essentially complete and work items remaining to be completed can be done without interfering with the Owner's ability to use the Project for its intended purpose.

1. Once the Contractor has reached what they believe is Substantial Completion, the Contractor shall notify the Designer and the Construction Representative of the following:

   a. That work is essentially complete with the exception of certain listed work items. The list shall be referred to as the "Contractor's Punch."

   b. That all Operation and Maintenance Manuals have been assembled and submitted in accordance with Article 3.5A.

   c. That the Work is ready for inspection by the Designer and Construction Representative. The Owner shall be entitled to a minimum of ten working days notice before the inspection shall be performed.

2. If the work is acceptable, the Owner shall issue a Certificate of Substantial Completion, which shall set forth the responsibilities of the Owner and the Contractor for utilities, security, maintenance, damage to the work and risk of loss. The Certificate shall also identify those remaining items of work to be performed by the Contractor. All such work items shall be complete within 30 working days of the date of the Certificate, unless the Certificate specifies a different time. If the Contractor shall be required to perform tests that must be delayed due to climatic conditions, it is understood that such tests and affected equipment will be identified on the Certificate and shall be accomplished by the Contractor at the earliest possible date. Performance of the tests may not be required before Substantial Completion can be issued. The date of the issuance of the Certificate of Substantial Completion shall determine whether or not the work was completed within the contract time and whether or not Liquidated Damages are due.

3. If the work is not acceptable, and the Owner does not issue a Certificate of Substantial Completion, the Owner shall be entitled to charge the Contractor with the Designer's and Owner's costs of re-inspection, including time and travel.

B. Partial Occupancy. Contractor agrees that the Owner shall be permitted to occupy and use any completed or partially completed portions of the Project, when such occupancy and use is in the Owner's best interest. Owner shall notify Contractor of its desire and intention to take Partial Occupancy as soon as possible but at least ten (10) working days before the Owner intends to occupy. If the Contractor believes that the portion of the work the Owner intends to occupy is not ready for occupancy, the Contractor shall notify the Owner immediately. The Designer shall inspect the work in accordance with the procedures above. If the Contractor claims increased cost of the project or delay in completion as a result of the occupancy, he shall notify the Owner immediately but in all cases before occupancy occurs.

C. Final Completion. The Project is finally complete when the Certificate of Substantial Completion has been issued and all work items identified therein as incomplete have been completed, and when all administrative items required by the contract have been completed. Final Completion entitles the Contractor to payment of the outstanding balance of the contract amount including all change orders and retainage. Within five (5) working days of the date of the Certificate of Substantial Completion, the Contractor shall identify the cost to complete any outstanding items of work. The Designer shall review the Contractor's estimate and either approve it or provide an independent estimate for all such items. If the Contractor fails to complete the remaining items within the time specified in the Certificate, the Owner may terminate the contract and go to the surety for project completion in accordance with Article 7.2 or release the contract balance to the Contractor less 150% of the

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

D. Liquidated Damages. Contractor agrees that the Owner may deduct from the contract price and retain as liquidated damages, and not as penalty or forfeiture, the sum stipulated in this contract for each work day after the Contract Completion Day on which work is not Substantially Complete. Assessment of Liquidated Damages shall not relieve the Contractor or the surety of any responsibility or obligation under the Contract. In addition, the Owner may, without prejudice to any other rights, claims, or remedies the Owner may have including the right to Liquidated Damages, charge the Contractor for all additional expenses incurred by the Owner and/or Designer as the result of the extended contract period through Final Completion. Additional Expenses shall include but not be limited to the costs of additional inspections.

E. Early Completion. The Contractor has the right to finish the work before the contract completion date; however, the Owner assumes no liability for any hindrances to the Contractor unless Owner caused delays result in a time extension to the contract completion date. The Contractor shall not be entitled to any claims for lost efficiencies or for delay if a Certificate of Substantial Completion is given on or before the Contract Completion Date.

ARTICLE 5.4 -- PAYMENT TO CONTRACTOR

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

1. Updated construction schedule
2. Certified payrolls consisting of name, occupation and craft, number of hours worked and actual wages paid for each individual employee, of the Contractor and all subcontractors working on the project

B. The Owner shall retain 5 percent of the amount of each such payment application, except as allowed by Article 5.4, until final completion and acceptance of all work covered by this contract.

C. Each payment made to Contractor shall be on account of the total amount payable to Contractor and all material and work covered by paid partial payment shall thereupon become the sole property of Owner. This provision shall not be construed as relieving Contractor from sole responsibility for care and protection of materials and work upon which payments have been made or restoration of any damaged work or as a waiver of the right of Owner to require fulfillment of all terms of this contract.

D. Materials delivered to the work site and not incorporated in the work will be allowed in the Application and Certification for Payment on the basis of one hundred (100%) percent of value, subject to the 5% retainage providing that they are suitably stored on the site or in an approved warehouse in accordance with the following requirements:

1. Material has previously been approved through submittal and acceptance of shop drawings conforming to requirements of Article 3.2 of General Conditions.
2. Delivery is made in accordance with the time frame on the approved schedule.
3. Materials, equipment, etc., are properly stored and protected from damage and deterioration and remain so - if not, previously approved amounts will be deleted from subsequent pay applications.
4. The payment request is accompanied by a breakdown identifying the material equipment, etc. in sufficient detail to establish quantity and value.

E. The Contractor shall be allowed to include in the Application and Certification for Payment, one hundred (100%) of the value, subject to retainage,

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

1. The request for consideration of payment for materials stored off site is made at least 15 working days prior to submittal of the Application for Payment including such material. Only materials inspected will be considered for inclusion on Application for Payment requests.
2. Materials stored in one location off site are valued in excess of $25,000.
3. That a Certificate of Insurance is provided indicating adequate protection from loss, theft conversion or damage for materials stored off site. This Certificate shall show the State of Missouri as an additional insured for this loss.
4. The materials are stored in a facility approved and inspected, by the Construction Representative.
5. Contractor shall be responsible for, Owner costs to inspect out of state facilities, and any delays in the completion of the work caused by damage to the material or for any other failure of the Contractor to have access to this material for the execution of the work.

F. The Owner shall determine the amount, quality and acceptability of the work and materials which are to be paid for under this contract. In the event any questions shall arise between the parties, relative to this contract or specifications, determination or decision of the Owner or the Construction Representative and the Designer shall be a condition precedent to the right of the Contractor to receive any money or payment for work under this contract affected in any manner or to any extent by such question.

G. Payments Withheld: The Owner may withhold or nullify in whole or part any certificate to such extent as may be necessary to protect the Owner from loss on account of:

1. Defective work not remedied. When a notice of noncompliance is issued on an item or items, corrective action shall be undertaken immediately. Until corrective action is completed, no monies will be paid and no additional time will be allowed for the item or items. The cost of corrective action(s) shall be borne by the Contractor.
2. A reasonable doubt that this contract can be completed for the unpaid balance.
3. Failure of the Contractor to update as-built drawings monthly for review by the Construction Representative.
4. Failure of the Contractor to update the construction schedule.

When the Construction Representative is satisfied the Contractor has remedied above deficiencies, payment shall be released.

H. Final Payment: Upon receipt of written notice from the Contractor to the Designer and Project Representative that the work is ready for final inspection and acceptance, the Designer and Project Representative, with the Contractor, shall promptly make such inspection. If the work is acceptable and the contract fully performed, the Construction Representative shall complete a final acceptance report and the Contractor will be directed to submit a final Application and Certification for Payment. If the Owner approves the same, the entire balance shall be due and payable, with the exception of deductions as provided for under Article 5.4.

1. Where the specifications provide for the performance by the Contractor of (certain tests for the purpose of balancing and checking the air conditioning and heating equipment and the Contractor shall have furnished and installed all such equipment in accordance with the specifications, but said test cannot then be made because of climatic conditions, such test shall may be considered as required under the provisions of the specifications, Section 013300 and this contract may be substantial Full payment will not be made until the tests have been made and the equipment and system is finally accepted. If the tests are not completed when scheduled, the Owner may deduct 150% of the value of the tests from the final payment.
2. The final payment shall not become due until the Contractor delivers to the Construction Representative:

a) A complete file of releases, on the standard form included in the contract documents as "Final Receipt of Payment and Release Form", from subcontractors and material suppliers evidencing payment in full for services, equipment and materials, as the case may require, if the Owner approves, or a consent from the Surety to final payment accepting liability for any unpaid amounts.

b) An Affidavit of Compliance with Prevailing Wage Law, in the form as included in this contract specifications, properly executed by each subcontractor, and the Contractor

c) Certified copies of all payrolls

d) As-built drawings

3. If any claim remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all monies that the latter may be compelled to pay in discharging such a claim including all costs and a reasonable attorney's fee.

4. Missouri statute requires prompt payment from the Owner to the Contractor within thirty calendar days and from the Contractor to his subcontractors within fifteen calendar days. Failure to make payments within the required time frame entitles the receiving party to charge interest at the rate of one and one half percent per month calculated from the expiration of the statutory time period until paid.

5. The value of all unused unit price allowances and/or 150% of the value of the outstanding work items, and/or liquidated damages may be deducted from the final pay request without executing a Contract Change. Any unit price items which exceed the number of units in the contract may be added by Contract Change.

ARTICLE 6 -- INSURANCE AND BONDS

ARTICLE 6.1 -- BOND

A. Contractor shall furnish a performance/payment bond in an amount equal to 100% of the contract price to guarantee faithful performance of the contract and 100% of the contract price to guarantee the payment of all persons performing labor on the project and furnishing materials in connection therewith under this contract as set forth in the standard form of performance and payment bond included in the contract documents. The surety on such bond shall be issued by a surety company authorized by the Missouri Department of Insurance to do business in the state of Missouri.

B. All Performance/Payment Bonds furnished in response to this provision shall be provided by a bonding company with a rating of B+ or higher as established by A.M. Best Company, Inc. in their most recent publication.

ARTICLE 6.2 – INSURANCE

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

B. Minimum Scope and Extent of Coverage

1. General Liability

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

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

2. Automobile Liability

Business Automobile Liability Insurance, ISO Coverage form number or equivalent CA 00 01 covering automobile liability, code 1 "ANY AUTO".

3. Workers' Compensation and Employer's Liability

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

4. Builder's Risk or Installation Floater Insurance

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

to Contractor and Owner as their respective interests may appear.

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

C. Minimum Limits of Insurance

1. General Liability

Contractor

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

2. Automobile Liability

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

3. Workers' Compensation and Employers Liability

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

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

D. Deductibles and Self-Insured Retentions

All deductibles, co-payment clauses, and self-insured retentions must be declared to and approved by the Owner. The Owner reserves the right to request the reduction or elimination of unacceptable deductibles or self-insured retentions, as they would apply to the Owner, and their respective officers, officials, agents, consultants and employees. Alternatively, the Owner may request Contractor to procure a bond guaranteeing payment of losses and related investigations, claims administration, and defense expenses.

E. Other Insurance Provisions and Requirements

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

1. General Liability

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

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

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

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

2. Automobile Insurance

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

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

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

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

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

3. Workers' Compensation/Employer's Liability

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

4. All Coverages

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

F. Insurer Qualifications and Acceptability

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

G. Verification of Insurance Coverage

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

ARTICLE 7 – SUSPENSION OR TERMINATION OF CONTRACT

ARTICLE 7.1 - FOR SITE CONDITIONS

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

ARTICLE 7.2 - FOR CAUSE

A. Termination or Suspension for Cause:

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

2. In the event the Owner suspends Contractor's right to proceed with the work or terminates the contract, the Owner may demand that the Contractor's surety take over and complete the work on this contract, after the surety submits a written proposal to the Owner and receives written approval and upon the surety's failure or refusal to do so within ten (10) consecutive calendar days after demand therefore, the Owner may take over the work and prosecute the same to completion by bid or negotiated contract, or the Owner may elect to take possession of and utilize in completing the work such materials, supplies, appliances and plant as may be on the site of the work, and all subcontractors, if the Owner elects, shall be bound to perform their contracts.

B. The Contractor and its surety shall be and remain liable to the Owner for any excess cost or damages occasioned to the Owner as a result of the actions above set forth.

C. The Contractor in the event of such suspension or termination shall not be entitled to receive any further payments under this contract until the work is wholly finished. Then if the unpaid balance under this contract shall exceed all expenses of the Owner as certified by the Director, such excess shall be paid to the Contractor; but, if such expenses shall exceed the unpaid balance as certified by the Director, the Contractor and their surety shall be liable for and shall pay the difference and any damages to the Owner.

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

E. The rights of the Owner to suspend or terminate as herein provided shall be cumulative and not exclusive and shall be in addition to any other remedy provided by law.

F. The Contractor in the event of such suspension or termination may be declared ineligible for Owner contracts for a minimal period of twelve (12) months. Further, no contract will be awarded to any Contractor who lists in their bid form any subcontractor whose prior performance has contributed, as determined by the Owner, to a breach of a contract. In order to be considered for state-awarded contracts after this period, the Contractor/subcontractor will be required to forward acceptance reports to the Owner regarding successful completion of non-state projects during the intervening twelve (12) months from the date of default. No contracts will be awarded to a subcontractor/Contractor until the ability to perform responsibly in the private sector has been proven to the Owner.

ARTICLE 7.3 -- FOR CONVENIENCE

A. The Owner may terminate or suspend the Contract or any portion of the Work without cause at any time, and at the Owner's convenience. Notification of a termination or suspension shall be in writing and shall be given to the Contractor and their surety. If the Contract is suspended, the notice will contain the anticipated duration of the suspension or the conditions under which work will be permitted to resume. If appropriate, the Contractor will be requested to demobilize and re-mobilize and will be reimbursed time and costs associated with the suspension.

B. Upon receipt of notification, the Contractor shall:

1. Cease operations when directed.

2. Take actions to protect the work and any stored materials.

3. Place no further subcontracts or orders for material, supplies, services or facilities except as may be necessary to complete the portion of the Contract that has not been terminated. No claim for payment of materials or supplies ordered after the termination date shall be considered.

4. Terminate all existing subcontracts, rentals, material, and equipment orders.

5. Settle all outstanding liabilities arising from termination with subcontractors and suppliers.

6. Transfer title and deliver to the Owner, work in progress, completed work, supplies and other material produced or acquire for the work terminated, and completed or partially completed plans, drawings information and other property that, if the Contract had been completed, would be required to be furnished to the Owner.

C. For termination without cause and at the Owner's convenience, in addition to payment for work completed prior to date of termination, the Contractor may be entitled to payment of other documented costs directly associated with the early termination of the contract. Payment for anticipated profit and unapplied overhead will not be allowed.

SECTION 007300 - SUPPLEMENTARY CONDITIONS

1.0 GENERAL:

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

2.0 CONTACTS:

Designer:
Garrett Wagner
Allgeier, Martin and Associates, Inc.
7231 East 24th Street
Joplin, MO. 65804-3485
Telephone: 417-680-7287
Email: Garrett.Wagner@amce.com

MONG Project Manager /
Construction Representative:
Jeremy Newton
Missouri National Guard-CFMO Office
6819a North Boundary Road
Jefferson City, Missouri 65101
Telephone: 573-308-6894
Email: jeremy.l.newton.nfg@army.mil

Contract Specialist:
April Howser
Division of Facilities Management, Design and Construction
301 West High Street, Room 730
Jefferson City, Missouri 65101
Telephone: 573-751-0053
Email: april.howser@oa.mo.gov

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

4.0 FURNISHING CONSTRUCTION DOCUMENTS:

A. The Owner will furnish the Contractor with approximately 10 complete sets of drawings and specifications at no charge.

B. The Owner will furnish the Contractor with approximately 10 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.

6.0 ENVIRONMENTAL MANAGEMENT SYSTEM (eMS):

The Missouri Army National Guard (MOARNG) has implemented an Environmental Management System (eMS). One of the key components of the eMS is the establishment of an Environmental Policy that must be communicated to all persons working for or on behalf of the organization including all suppliers and contractors. This policy stresses commitment to compliance with accepted environmental practices, and meeting or exceeding applicable environmental requirements, legal and otherwise. This policy also stresses commitment to waste minimization, pollution prevention, and management of personnel, processes, real property, and materials in a manner to reduce environmental impacts. The policy is available upon request to all parties by contacting the Environmental Management Office at (573) 638-9514.

7.0 OFF-SITE BORROW & SPOIL DEPOSIT SITES FOR FEDERALLY FUNDED PROJECTS:

All Federally funded projects which involve off-site borrow and/or off-site spoil deposit sites will require written certification that the site(s) are in compliance with the National Environmental Protection Act and all related applicable Federal and State laws and regulations. If the need for off-site borrow and/or spoil sites is stipulated in the Contract Documents, the following applies:

A. The Contractor is required to use only the designated site described in the Contract Documents. If another off-site area is proposed by the Contractor, the Contractor must provide written certification to the Division of Facilities Management, Design and Construction Project Representative that the proposed borrow or spoil site has been cleared of environmental concerns in accordance with all applicable Federal and State laws and regulations. These include but are not limited to the following: Clean Water Act; the Endangered Species Act; the National Historic Preservation Act (NHPA) (The site must have Section 106 Clearance); the Farmland Protection Act; Resource Conservation and Recovery Act; Comprehensive Environmental Response; Compensation and Liability Act; and RSMo Chapter 194, Section 194.400, Unmarked Human Burial Sites. Certifications shall include clearance letters and other evidence of coordination with the appropriate regulatory agencies. The Missouri Historic Preservation Office, PO Box 176 Jefferson City, MO 65102, may be contacted to provide assistance with the NHPA and cultural resource issues pertaining to the borrow and spoil site regulations. The Missouri State Historic Preservation Office can provide a list of qualified and certified archaeologists to assist in borrow and spoil site investigations.

B. If project conditions require off-site borrow or off-site deposit of spoils, the Contractor will be required to provide written certification to the Division of Facilities Management, Design and Construction Project Representative that the proposed borrow or spoil site has been cleared of environmental concerns in accordance with all applicable Federal and State laws and regulations. These include but are not limited to the following: Clean Water Act; the Endangered Species Act; the National Historic Preservation Act (NHPA) (The site must have Section 106 Clearance); the Farmland Protection Act; Resource Conservation and Recovery Act; Comprehensive Environmental Response; Compensation and Liability Act; and RSMo Chapter 194, Section 194.400, Unmarked Human Burial Sites. Certifications shall include clearance letters and other evidence of coordination with the appropriate regulatory agencies. The Missouri Historic Preservation Office, PO Box 176 Jefferson City, MO 65102, may be contacted to provide assistance with the NHPA and cultural resource issues pertaining to the borrow and spoil site regulations. The Missouri State Historic Preservation Office can provide a list of qualified and certified archaeologists to assist in borrow and spoil site investigations.

C. The Owner recognizes that additional time (beyond what is allowed in the Construction Contract) may be required in order to secure the aforementioned certifications and approvals. Should more time be required, the Owner will consider approval of a no-cost time extension contract change. The Contractor will be required to provide documentation that substantiates the need for the time extension.

SUPPLEMENTARY GENERAL CONDITIONS
FOR FEDERALLY FUNDED/ASSISTED CONSTRUCTION PROJECTS

(American Rescue Plan Act (ARPA) Projects)

1.0 Notice of Federal Funding

This project is being performed in whole or in part using federal funds. Therefore, all work or services performed by the Contractor and its subcontractors shall be subject to the terms and conditions set forth below in addition to all terms and conditions in the Construction Contract, General Conditions, and other contract documents. The concepts, rules, and guidelines set forth in 2 C.F.R. 200 describing allowable costs and administrative requirements apply.

2.0 Definitions

As used herein, "Federal Government" means the government of the United States of America. "Federal Agency" means an agency, entity, department or division of the Federal Government that is providing funding for this project. All other terms shall have the meanings established in the Construction Contract, General Conditions, and/or Project Manual, unless such definitions conflict with a definition provided in an applicable statute or regulation.

3.0 Conflicting Terms or Conditions

To the extent that any terms or conditions set forth herein conflict with the Construction Contract or its General Conditions, the more stringent of the two terms and conditions shall govern.

4.0 No Obligation by Federal Government

The Federal Government is not a party to this contract and is not subject to any obligations or liabilities to the non-Federal entity, Contractor, or any other party pertaining to any matter resulting from the contract.

5.0 Compliance with Federal Laws, Regulations and Executive Orders

The Contractor and its subcontractors and suppliers are required to comply with all applicable Federal laws, regulations, and executive orders, regardless of whether set forth herein. The Contractor shall assist and enable the State of Missouri in complying with any requirements imposed by the Federal Agency as a condition of funding.

6.0 Compliance with Civil Rights Provisions

The Contractor shall comply with all Federal statutes, executive orders, and regulations relating to nondiscrimination. These include, but are not limited to the following:

Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin;

Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex;

Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps;

The Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age;

Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing;

Title VII of the Civil Rights Act of 1964 (42 U.S.C. part 2000(e), which prohibits discrimination against employees on the basis of religion;

Any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and

The requirements of any other nondiscrimination statute(s) that may apply to the application.

7.0 Equal Employment Opportunity (41 C.F.R. 60-1.4(b)).

During the performance of this contract, the Contractor agrees as follows:

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

(3) The Contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicants or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the Contractor's legal duty to furnish information.

(4) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(5) The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(6) The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(7) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(8) The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: *Provided,* That if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and sub contractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and sub contractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any

further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

8.0 Notice of Requirement for Affirmative Action To Ensure Equal Employment Opportunity (Executive Order 11246**,** 41 C.F.R. 60-4.2)

(1) The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Specifications" set forth herein.

(2) The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Time-tables	**Goals for minority participation for each trade**	**Goals for female participation in each trade**
108	2.3%	6.9%

Insert Goals Established by U.S. Department of Labor: available at https://www.dol.gov/sites/dolgov/files/ofccp/ParticipationGoals.pdf.

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and nonfederally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 C.F.R. pt. 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 C.F.R. 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 C.F.R. pt. 60-4. Compliance with the goals will be measured against the total work hours performed.

(3) The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.

(4) As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is (insert description of the geographical areas where the contract is to be performed giving the state, county and city, if any).

9.0 Standard Federal Equal Employment Opportunity Construction Contract Specifications (Executive Order 11246 - 41 C.F.R. 60-4.3)

(1) As used in these specifications:

a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;

b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;

c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.

d. "Minority" includes:

(i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);

(ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);

(iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and

(iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

(2) Whenever the Contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of $10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

(3) If the Contractor is participating (pursuant to 41 C.F.R. 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each contractor or subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other contractors or subcontractors toward a goal in an approved Plan does not excuse any covered contractor's or subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

(4) The Contractor shall implement the specific affirmative action standards provided in paragraphs 7 a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered Construction contractors performing construction work in

geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the FEDERAL REGISTER in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.

(5) Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

(6) In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

(7) The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.

d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by

the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.

f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with onsite supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other contractors and subcontractors with whom the Contractor does or anticipates doing business.

i. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's work force.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 C.F.R. pt. 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

(8) Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

(9) A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

(10) The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, sexual orientation, gender identity, or national origin.

(11) The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

(12) The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

(13) The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 C.F.R. 60-4.8.

(14) The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each

employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

(15) Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

10.0 Prohibition of Segregated Facilities

(1) The Contractor agrees that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this clause is a violation of the Equal Employment Opportunity clause in this contract.

(2) "Segregated facilities," as used in this clause, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.

(3) The Contractor shall include this clause in every subcontract and purchase order that is subject to the Equal Employment Opportunity clause of this contract.

11.0 Davis-Bacon Act (40 U.S.C. §§ 3141-3144, and §§ 3146-3148, and 29 C.F.R. pt. 5)

**The requirements of the Davis-Bacon Act and this section are not applicable to this project, which is funded solely by Coronavirus State and Local Fiscal Recover Funds (SLFRF) under the American Rescue Plan Act (ARPA).*

(1) Minimum wages.

(i) All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 C.F.R. pt. 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis–Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for

more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in § 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided*, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis–Bacon poster (WH–1321) shall be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(ii)(A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30–day period that additional time is necessary.

(C) In the event the Contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30–day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii)(B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, *Provided*, That the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis–Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(2) Withholding. The (write in name of Federal Agency or the loan or grant recipient) shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the Contractor under this contract or any other Federal contract with the same prime Contractor, or any other federally-assisted contract subject to Davis–Bacon prevailing wage requirements, which is held by the same prime Contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, the (Agency) may, after written notice to the Contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) Payrolls and basic records.

(i) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis–Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 C.F.R. 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis–Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the (write in name of appropriate federal agency) if the agency is a party to the contract, but if the agency is not such a party, the Contractor will submit the payrolls to the applicant, sponsor, or owner, as the case may be, for transmission to the (write in name of agency). The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 C.F.R. 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available

for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/esa/whd/forms/wh347instr.htm or its successor site. The prime Contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the (write in name of appropriate federal agency) if the agency is a party to the contract, but if the agency is not such a party, the Contractor will submit them to the applicant, sponsor, or owner, as the case may be, for transmission to the (write in name of agency), the Contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime Contractor to require a subcontractor to provide addresses and social security numbers to the prime Contractor for its own records, without weekly submission to the sponsoring government agency (or the applicant, sponsor, or owner).

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 C.F.R. pt. 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 C.F.R. pt. 5, and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 C.F.R. pt. 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the Contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

(iii) The Contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the (write the name of the agency) or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit the required records or to make them available, the Federal Agency may, after written notice to the Contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 C.F.R. 5.12.

(4) Apprentices and trainees—

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a Contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 C.F.R. 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 C.F.R. pt. 30.

(5) Compliance with Copeland Act requirements. The Contractor shall comply with the requirements of 29 C.F.R. pt. 3, which are incorporated by reference in this contract.

(6) Subcontracts. The Contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 C.F.R. 5.5(a)(1) through (10) and such other clauses as the (write in the name of the Federal Agency) may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime Contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 C.F.R. 5.5.

(7) Contract termination: debarment. A breach of the contract clauses in 29 C.F.R. 5.5 may be grounds for termination of the contract, and for debarment as a Contractor and a subcontractor as provided in 29 C.F.R. 5.12.

(8) Compliance with Davis–Bacon and Related Act requirements. All rulings and interpretations of the Davis–Bacon and Related Acts contained in 29 C.F.R. pts. 1, 3, and 5 are herein incorporated by reference in this contract.

(9) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 C.F.R. pt.s 5, 6, and 7. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

(10) Certification of eligibility.

(i) By entering into this contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis–Bacon Act or 29 C.F.R. 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis–Bacon Act or 29 C.F.R. 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. § 1001.

12.0 Copeland "Anti-Kickback" Act

(1) The Contractor shall comply with 18 U.S.C. § 874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. pt. 3 as may be applicable, which are incorporated by reference into this contract. The Contractor and subcontractors are prohibited from inducing, by any means, any person employed on the project to give up any part of the compensation to which the employee is entitled.

(2) The Contractor or subcontractor shall insert in any subcontracts the clause above, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime Contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of these contract clauses.

(3) A breach of the contract clauses above may be grounds for termination of the contract, and for debarment as a Contractor and subcontractor as provided in 29 C.F.R. 5.12.

13.0 Contract Work Hours and Safety Standards Act (40 U.S.C. 3701 to 3708, 29 C.F.R. 5.5)

(1) Overtime requirements. No Contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1) of this section the Contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this section, in the sum of $27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The Owner shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or subcontractor under any such contract or any other Federal contract with the same prime Contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime Contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.

(4) Subcontracts. The Contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime Contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this section.

14.0 Suspension and Debarment (Executive Orders 12549 and 12689, 2 C.F.R. pt. 180)

(1) A contract award (see 2 C.F.R. 180.220) must not be made to parties listed on the government-wide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 C.F.R. 180 that implement Executive Orders 12549 (3 C.F.R. pt. 1986 Comp., p. 189) and 12689 (3 C.F.R. pt. 1989 Comp., p. 235), "Debarment and Suspension." SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

(2) The contractor is required to verify that none of the contractor's principals (defined at 2 C.F.R. 180.995) or its affiliates (defined at 2 C.F.R. 180.905) are excluded (defined at 2 C.F.R. 180.940) or disqualified (defined at 2 C.F.R. 180.935).

(3) The contractor must comply with 2 C.F.R. pt. 180, subpart C and the regulations of the granting Federal Agency regarding suspension and debarment, and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.

(4) This certification is a material representation of fact relied upon by the Owner. If it is later determined that the Contractor did not comply with 2 C.F.R. pt. 180, subpart C in addition to remedies available to the Owner, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

(5) By submitting a bid, the bidder or proposer agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

15.0 Byrd Anti-Lobbying Amendment (31 U.S.C. § 1352)

(1) Contractors that apply or bid for an award exceeding $100,000 agree to file the required certification (set forth below), in compliance with 31 U.S.C. § 1352 (as amended).

(2) Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352.

(3) Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency.

CERTIFICATION REGARDING LOBBYING

The Bidder or Offeror certifies by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form–LLL, “Disclosure Form to Report Lobbying,” in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

16.0 Procurement of Recovered Materials

The Contractor shall comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (42 U.S.C. § 6962). The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds $10,000 or the value of the quantity acquired during the preceding fiscal year exceeded $10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

Information about this requirement, along with the list of EPA designated items, is available at EPA's Comprehensive Procurement Guidelines web site, https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program.

17.0 Fair Labor Standards Act

All contracts and subcontracts that result from this solicitation incorporate by reference the provisions of 29 C.F.R. pt. 201, the Federal Fair Labor Standards Act (FLSA), with the same force and effect as if given in full text. The FLSA sets minimum wage, overtime pay, recordkeeping, and child labor standards for full and part-time workers. The Contractor has full responsibility to monitor compliance to the referenced statute or regulation. The Contractor must address any claims or disputes that arise from this requirement directly with the U.S. Department of Labor – Wage and Hour Division.

18.0 Access to Records and Reports

The Contractor must maintain an acceptable cost accounting system. The Contractor agrees to provide the Owner, the Federal Agency and the Comptroller General of the United States or any of their duly authorized representatives access to any books, documents, papers and records of the Contractor which are directly pertinent to the specific contract for the purpose of making audit, examination, excerpts and transcriptions. The Contractor agrees to maintain all books, records and reports required under this contract for a period of not less than three years after final payment is made and all pending matters are closed.

19.0 Occupational Health and Safety Act

All contracts and subcontracts that result from this solicitation incorporate by reference the requirements of 29 C.F.R. pt. 1910 with the same force and effect as if given in full text. The employer must provide a work environment that is free from recognized hazards that may cause death or serious physical harm to the employee. The employer retains full responsibility to monitor its compliance and their subcontractor's compliance with the applicable requirements of the Occupational Safety and Health Act of 1970 (20 C.F.R.

pt. 1910). The employer must address any claims or disputes that pertain to a referenced requirement directly with the U.S. Department of Labor – Occupational Safety and Health Administration.

20.0 Rights to Inventions

Contracts or agreements that include the performance of experimental, developmental, or research work must provide for the rights of the Federal Government and the Owner in any resulting invention as established by 37 C.F.R. pt. 401, Rights to Inventions Made by Non-profit Organizations and Small Business Firms under Government Grants, Contracts, and Cooperative Agreements. This contract incorporates by reference the patent and inventions rights as specified within 37 C.F.R. 401.14. Contractor must include this requirement in all sub-tier contracts involving experimental, developmental, or research work.

21.0 Energy Conservation

The Contractor agrees to comply with mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 U.S.C. § 6201et seq.).

22.0 Clean Air Act and Federal Water Pollution Control Act

(1) If the amount of the Contract exceeds $150,000, the Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq. and the Federal Water Pollution Control Act, as amended, 33 U.S.C. § 1251 et seq.

(2) The Contractor agrees to report each violation to the Owner, and understands and agrees that the Owner will, in turn, report each violation as required to assure notification to the Federal Agency and the appropriate Environmental Protection Agency Regional Office.

(3) The Contractor agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance.

23.0 Contractor Employee Whistleblower Rights and Requirement to Inform Employees of Whistleblower Rights

(1) This contract and employees working on this contract will be subject to the whistleblower rights and remedies in the pilot program on contractor employee whistleblower protections established at 41 U.S.C. § 4712 by section 828 of the National Defense Authorization Act for Fiscal Year 2013 (Pub. L. 112-239) and FAR 3.908.

(2) The Contractor shall inform its employees in writing, in the predominant language of the workforce, of employee whistleblower rights and protections under 41 U.S.C. § 4712, as described in section 3.908 of the Federal Acquisition Regulation.

(3) The Contractor shall insert the substance of this clause, including this paragraph (c), in all subcontracts over the simplified acquisition threshold.

24.0 Veteran's Preference

In the employment of labor (excluding executive, administrative, and supervisory positions), the Contractor and all sub-tier contractors must give preference to covered veterans as defined within Title 49 United

States Code Section 47112. Covered veterans include Vietnam-era veterans, Persian Gulf veterans, Afghanistan-Iraq war veterans, disabled veterans, and small business concerns (as defined by 15 U.S.C. § 632) owned and controlled by disabled veterans. This preference only applies when there are covered veterans readily available and qualified to perform the work to which the employment relates.

25.0 Drug Free Workplace Act

The Contractor shall provide a drug free workplace in accordance with the Drug Free Workplace Act of 1988, 41 U.S.C. Chapter 81, and all applicable regulations. The Contractor shall report any conviction of the Contractor's personnel under a criminal drug statute for violations occurring on the Contractor's premises or off the Contractor's premises while conducting official business. A report of a conviction shall be made to the state agency within five (5) working days after the conviction.

26.0 Access Requirements for Persons with Disabilities

Contractor shall comply with 49 U.S.C. § 5301(d), stating Federal policy that the elderly and persons with disabilities have the same rights as other persons to use mass transportation services and facilities and that special efforts shall be made in planning and designing those services and facilities to implement that policy. Contractor shall also comply with all applicable requirements of Sec. 504 of the Rehabilitation Act (1973), as amended, 29 U.S.C. § 794, which prohibits discrimination on the basis of handicaps, and the Americans with Disabilities Act of 1990 (ADA), as amended, 42 U.S.C. § 12101 et seq., which requires that accessible facilities and services be made available to persons with disabilities, including any subsequent amendments thereto.

27.0 Seismic Safety

The Contractor agrees to ensure that all work performed under this contract, including work performed by subcontractors, conforms to a building code standard that provides a level of seismic safety substantially equivalent to standards established by the National Earthquake Hazards Reduction Guidelines for Contract Provisions for Obligated Sponsors and Airport Improvement Program Projects Issued on June 19, 2018 Page 61 Program (NEHRP). Local building codes that model their code after the current version of the International Building Code (IBC) meet the NEHRP equivalency level for seismic safety.

28.0 Required Use of American Iron, Steel, Manufactured Products, and Construction Materials – Build America, Buy America (Pub. L. No. 117-58, §§ 70901-52)

***The requirements of the Build America, Buy America Act and this section are not applicable to projects funded solely by Coronavirus State and Local Fiscal Recover Funds (SLFRF) under the American Rescue Plan Act (ARPA). The Contractor will be subject to the requirements of the Build America, Buy America Act only if SLFRF funds are used in conjunction with funds from another federal program that requires enforcement of the Build America, Buy America Act. Information about federal funding sources is provided in the Invitation for Bid.*

The Owner is the recipient of an award of Federal financial assistance from a program for infrastructure for this project. Pursuant to the Build America, Buy America Act of the Infrastructure Investment and Jobs Act ("IIJA"), Pub. L. No. 117-58, none of the funds provided under the Federal award may be used unless the requirements of the domestic content procurement preference outlined below are met. Therefore, the Contractor shall ensure the following:

(1) all iron and steel used in the project are produced in the United States--this means all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States;

(2) all manufactured products used in the project are produced in the United States—this means the manufactured product was manufactured in the United States; and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product, unless another standard for determining the minimum amount of domestic content of the manufactured product has been established under applicable law or regulation; and

(3) all construction materials are manufactured in the United States—this means that all manufacturing processes for the construction material occurred in the United States.

The Buy America preference only applies to articles, materials, and supplies that are consumed in, incorporated into, or affixed to an infrastructure project. As such, it does not apply to tools, equipment, and supplies, such as temporary scaffolding, brought to the construction site and removed at or before the completion of the infrastructure project. Nor does a Buy America preference apply to equipment and furnishings, such as movable chairs, desks, and portable computer equipment, that are used at or within the finished infrastructure project, but are not an integral part of the structure or permanently affixed to the infrastructure project.

Waivers

When necessary, recipients of Federal financial assistance may apply for, and the awarding agency may grant, a waiver from the domestic content procurement preference.

When the Federal agency has made a determination that one of the following exceptions applies, the awarding official may waive the application of the domestic content procurement preference in any case in which the agency determines that:

(1) applying the domestic content procurement preference would be inconsistent with the public interest;

(2) the types of iron, steel, manufactured products, or construction materials are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality; or

(3) the inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25 percent. A request to waive the application of the domestic content procurement preference must be in writing. The agency will provide instructions on the format, contents, and supporting materials required for any waiver request. Waiver requests are subject to public comment periods of no less than 15 days and must be reviewed by the Made in America Office.

There may be instances where an award qualifies, in whole or in part, for an existing waiver described on the awarding agency web site.

If the Contractor determines that an application for a waiver is necessary or an existing waiver is applicable to this project, the Contractor shall timely notify the Owner. The Owner will make a determination if a waiver is applicable or if a waiver application is necessary. The Contractor shall not submit any waiver application or information directly to the Federal agency without prior approval by the Owner.

Definitions

"Construction materials" includes an article, material, or supply—other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives—that is or consists primarily of: • non-ferrous metals; • plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables); • glass (including optic glass); • lumber; or • drywall.

"Domestic content procurement preference'' means all iron and steel used in the project are produced in the United States; the manufactured products used in the project are produced in the United States; or the construction materials used in the project are produced in the United States.

"Infrastructure" includes, at a minimum, the structures, facilities, and equipment for, in the United States, roads, highways, and bridges; public transportation; dams, ports, harbors, and other maritime facilities; intercity passenger and freight railroads; freight and intermodal facilities; airports; water systems, including drinking water and wastewater systems; electrical transmission facilities and systems; utilities; broadband infrastructure; and buildings and real property. Infrastructure includes facilities that generate, transport, and distribute energy.

"Project" means the construction, alteration, maintenance, or repair of infrastructure in the United States.

29.0 Prohibition on Certain Telecommunication and Video Surveillances Services or Equipment (Pub. L. 115-232, Section 889)

Section 889(b) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019, Pub. L. No. 115-232, and 2 C.F.R. § 200.216 prohibit the head of a Federal executive agency and recipients or subrecipients of funds from such agencies from obligating or expending grant, cooperative agreement, loan, or loan guarantee funds on certain telecommunications products or from certain entities for national security reasons. Pursuant to such provisions, the Contractor understands and agrees that the Contractor and its subcontractors shall not obligate or expend loan or grant funds from the Federal Agency under this Contract to:

(1) Procure or obtain;

(2) Extend or renew a contract to procure or obtain; or

(3) Enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in Public Law 115–232, section 889, covered telecommunications equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).

(i) For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).

(ii) Telecommunications or video surveillance services provided by such entities or using such equipment.

(iii) Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

TERMS AND CONDITIONS FOR CONTRACTOR RECEIPT OF FEDERAL ARPA SFRF FUNDS

I. Use of Funds: _____ ("Contractor") understands and agrees that the State of Missouri has received funds for this project under section 602(c) of the Social Security Act ("Act"), as added by Section 9901 of the American Rescue Plan Act ("ARPA"), Pub. L. No. 117-2 (March 11, 2021), 135 Stat. 4, 223–26, and the funds disbursed under such grant may only be used in compliance with the ARPA and the U.S. Department of the Treasury ("Treasury")'s regulations implementing that section and guidance, and in compliance with all other restrictions and specifications on use set forth in or applicable through this agreement.

Period of Performance: The period of performance for the award begins on the date hereof and ends no later than December 31, 2026. Contractor may use funds granted under this agreement to cover eligible costs incurred during the period of performance, but no later than December 31, 2024.

Reporting: Contractor agrees to comply with any reporting obligations established by Treasury or the State of Missouri ("State"), as it relates to this agreement.

Maintenance of and Access to Records: Contractor shall maintain records and financial documents sufficient to evidence compliance with section 602(c) of the Act and Treasury's regulations implementing that section and guidance regarding the eligible uses of funds. Contractor shall also maintain records and financial documents: 1. sufficient for the State, with respect to Contractor's participation in this grant agreement, to evidence compliance with section 602(c) of the Act and Treasury's regulations implementing that section and guidance regarding the eligible uses of funds; and 2. necessary for the State, with respect to Contractor's participation in this agreement, to comply with obligations under 2 C.F.R. Part 200 and any other applicable law. The Treasury Office of Inspector General, the Government Accountability Office, their authorized representatives, the State, or its authorized representatives, shall have the right of access to records and documents (electronic and otherwise) of Contractor in order to conduct audits or other investigations or reviews. Records shall be maintained by Contractor for a period of five (5) years after the end of the period of performance. Wherever practicable, records should be collected, transmitted, and stored in open and machine-readable formats. Contractor's obligations under this section shall include, without limitation, maintenance of the following specified types of records and financial documents: contracts, invoices, receipts, payrolls, and financial statements.

Pre-award Costs: Pre-award costs, as defined at 2 C.F.R. § 200.458, may not be paid with funding from this agreement.

Compliance with Applicable Law and Regulations: Contractor agrees to comply with the requirements of section 602 of the Act, regulations adopted by Treasury pursuant to section 602(f) of the Act, guidance issued by Treasury regarding the foregoing, and all other restrictions and specifications set forth in or applicable through this agreement. Contractor also agrees to comply with all other applicable state and federal statutes, regulations, and executive orders, and

Contractor shall provide for such compliance by other parties in any agreements it enters into with other parties relating to this grant.

Federal regulations applicable to this agreement include, without limitation, the following:

i. If the amount of this agreement is expected to equal or exceed $25,000, or if this agreement is for federally-required audit services, OMB Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement), 2 C.F.R. Part 180, and Treasury's implementing regulation at 31 C.F.R. Part 19, including both the requirement to comply with that part's Subpart C as a condition of participation in this transaction, and the requirement to pass the requirement to comply with that subpart to each person with whom the participant enters into a covered transaction at the next lower tier;

ii. Recipient Integrity and Performance Matters, pursuant to which the award term set forth at 2 C.F.R. Part 200, Appendix XII, is hereby incorporated by reference;

iii. Uniform Relocation Assistance and Real Property Acquisitions Act of 1970 (42 U.S.C. §§ 4601–4655) and implementing regulations; and

iv. Generally applicable federal environmental laws and regulations.

Federal statutes and regulations prohibiting discrimination applicable to this agreement include, without limitation, the following:

i. Title VI of the Civil Rights Act of 1964 (42 U.S.C. §§ 2000d *et seq*.) and Treasury's implementing regulations at 31 C.F.R. Part 22, which prohibit discrimination on the basis of race, color, or national origin under programs or activities receiving federal financial assistance;

ii. the Fair Housing Act, Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§ 3601 *et seq*.) which prohibits discrimination in housing on the basis of race, color, religion, national origin, sex, familial status, or disability;

iii. Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. § 794), which prohibits discrimination on the basis of disability under any program or activity receiving federal financial assistance;

iv. the Age Discrimination Act of 1975, as amended (42 U.S.C. §§ 6101 *et seq*.) and Treasury's implementing regulations at 31 C.F.R. Part 23, which prohibit discrimination on the basis of age in programs or activities receiving federal financial assistance; and

v. For local governments only, Title II of the Americans with Disabilities Act of 1990, as amended (42 U.S.C. §§ 12101 *et seq*.), which prohibits discrimination on the basis of disability under programs, activities, and services provided or made available by state and local governments or instrumentalities or agencies thereto.

Remedial Actions: The State reserves the right to impose additional conditions or requirements on Contractor's receipt of this funds under this agreement, as the State deems necessary or advisable, in order to facilitate compliance with any existing or additional conditions or requirements imposed upon the State by Treasury for the State's receipt of ARPA funds. The State also reserves the right to seek recoupment or repayment of funds under this agreement in whole or in part, in the event that Treasury seeks recoupment or repayment of payments made to the State, for reasons relating to Contractor's acts or omissions respecting this agreement. These reservations are expressed without limitation to any other rights the State may hold, either to impose additional conditions or requirements on Contractor's receipt of funds under this agreement or to recoup such funds in whole or in part, under this agreement or other applicable law.

Hatch Act: Contractor agrees to comply, as applicable, with requirements of the Hatch Act (5 U.S.C. §§ 1501–1508 and 7324–7328), which limit certain political activities of State or local government employees whose principal employment is in connection with an activity financed in whole or in part by this federal assistance.

False Statements: Contractor understands that making false statements or claims in connection with this award is a violation of federal law and may result in criminal, civil, or administrative sanctions, including fines, imprisonment, civil damages and penalties, debarment from participating in federal awards or contracts, and/or any other remedy available by law.

Publications: Any publications produced with funds from this agreement must display the following language: "This product [is being] [was] supported, in whole or in part, by federal award number [enter project FAIN] awarded to State of Missouri by the U.S. Department of the Treasury."

Debts Owed State and Federal Government: Any funds paid to Contractor (1) in excess of the amount to which Contractor is finally determined to be authorized to retain under the terms of this agreement; (2) that are determined by the Treasury Office of Inspector General to have been misused; or (3) that are determined by Treasury to be subject to a repayment obligation pursuant to sections 602(e) and 603(b)(2)(D) of the Act and have not been repaid by Contractor shall constitute a debt owed by the State to the federal government. In such instance, the funds constituting the State's debt to the federal government shall also constitute Contractor's debt to the State. Debts owed by Contractor to the State must be paid promptly by Contractor. A debt owed the State by Contractor under this agreement is delinquent if it has not been paid by the date specified in the State's initial demand for payment, unless other satisfactory arrangements have been made or if Contractor knowingly or improperly retains funds that are a debt as defined in this paragraph. The State will take any actions available to it to collect such a debt, including but not limited to actions available to it under the "Remedial Actions" paragraph found in this same section (I) above. The rights of the State as expressed in this paragraph are in addition to, and do not imply the exclusion of, any other rights the State may have under applicable law to collect a debt or seek damages from Contractor.

Disclaimer: In its award of federal financial assistance to the State, Treasury provides that the United States expressly disclaims any and all responsibility or liability to the State or third

persons for the actions of the State or third persons resulting in death, bodily injury, property damages, or any other losses resulting in any way from the performance of this award or any other losses resulting in any way from the performance of this award or any contract or subcontract under this award. Furthermore, in its award of federal financial assistance to the State, Treasury also states that the acceptance of this award by the State does not in any way establish an agency relationship between the United States and the State. This disclaimer applies with equal force to this agreement.

Increasing Seat Belt Use in the United States: Pursuant to Executive Order 13043, 62 FR 19217 (Apr. 18, 1997), Contractor is hereby encouraged to adopt and enforce on-the-job seat belt policies and programs for its employees when operating company-owned, rented or personally owned vehicles, and to encourage any subcontractors to do the same.

Reducing Text Messaging While Driving: Pursuant to federal Executive Order 13513, 74 FR 51225 (Oct. 6, 2009), the State hereby encourages Contractor to adopt and enforce policies that ban text messaging while driving, and to encourage any subcontractors to do the same.[1]

II. By entering into this agreement, Contractor ensures its current and future compliance with Title VI of the Civil Rights Act of 1964, as amended, which prohibits exclusion from participation, denial of the benefits of, or subjection to discrimination under programs and activities receiving federal funds, of any person in the United States on the ground of race, color, or national origin (42 U.S.C. § 2000d et seq.), as implemented by Treasury Title VI regulations at 31 C.F.R. Part 22 and other pertinent executive orders such as federal Executive Order 13166; directives; circulars; policies; memoranda and/or guidance documents.

Contractor acknowledges that federal Executive Order 13166, "Improving Access to Services for Persons with Limited English Proficiency," seeks to improve access to federally assisted programs and activities for individuals who, because of national origin, have Limited English Proficiency ("LEP"). Contractor understands that denying a person access to its programs, services, and activities because of LEP is a form of national origin discrimination prohibited under Title VI of the Civil Rights Act of 1964 and Treasury's implementing regulations. Accordingly, Contractor shall initiate reasonable steps, or comply with Treasury's directives, to ensure that LEP persons have meaningful access to its programs, services, and activities. Contractor understands and agrees that meaningful access may entail providing language assistance services, including oral interpretation and written translation where necessary, to ensure effective communication in Contractor's programs, services, and activities.

Contractor agrees to consider the need for language services for LEP persons during development of applicable budgets and when conducting programs, services, and activities. As a resource, Treasury has published its LEP guidance at 70 FR 6067. For more information on LEP, please visit http://www.lep.gov.

[1] Section I is based on requirements set forth in Treasury's Coronavirus State Fiscal Recovery Fund Award Terms and Conditions document, executed by the State on July 26, 2021.

Contractor acknowledges and agrees that compliance with this assurance constitutes a condition of continued receipt of federal financial assistance and is binding upon Contractor and Contractor's successors, transferees, and assignees for the period in which such assistance is provided.

Contractor shall comply with Title VI of the Civil Rights Act of 1964, which prohibits recipients of federal financial assistance from excluding from a program or activity, denying benefits of, or otherwise discriminating against a person on the basis of race, color, or national origin (42 U.S.C. § 2000d et seq.*), as implemented by the Department of the Treasury's Title VI regulations, 31 C.F.R. Part 22, which are herein incorporated by reference and made a part of this agreement. Title VI also includes protection to persons with "Limited English Proficiency" in any program or activity receiving federal financial assistance, 42 U.S.C. § 2000d* et seq.*, as implemented by the Department of the Treasury's Title VI regulations 31 C.F.R. Part 22, and herein incorporated by reference and made a part of this agreement.*

Contractor shall cooperate in any enforcement or compliance review activities by Treasury or the State of the aforementioned obligations. Enforcement may include investigation, arbitration, mediation, litigation, and monitoring of any settlement agreements that may result from these actions. That is, Contractor shall comply with information requests, on-site compliance review, and reporting requirements.

Contractor shall maintain and provide to applicants, beneficiaries, their representatives, or any other party requesting the same, information on how to file a Title VI complaint of discrimination with the State of Missouri.

Contractor shall provide to the State documentation of an administrative agency's or court's findings of non-compliance of Title VI and efforts to address the non-compliance, including any voluntary compliance or other agreements between Contractor and the administrative agency that makes any such finding. If Contractor settles a case or matter alleging such discrimination, Contractor must provide to the State documentation of the settlement. If Contractor has not been the subject of any court or administrative agency finding of discrimination, Contractor shall so state.

The United States of America has the right to seek judicial enforcement of the terms of this assurances section and nothing in this section alters or limits the federal enforcement measures that the United States may take in order to address violations of this section or applicable federal law.

Under penalty of perjury, the undersigned certifies that he/she has read and understood this section's obligations as herein described, that any information submitted in conjunction with this assurance document is accurate and complete, and that Contractor is in compliance with the aforementioned nondiscrimination requirements.

By signing this certification, the undersigned represents his or her intention, and legal authorization, to do so on behalf of Contractor.[2]

_____ Date: _____
Signature of Contractor's Authorized Representative

_____
Printed Name of Contractor's Authorized Representative

Contractor's Unique Entity Identifier: _____
(*Name associated with the Unique Entity Identifier must match the Contractor's name on contract documents)

III. This agreement shall be conducted in accordance with the standards set forth at 2 C.F.R. §§ 200.317 through 200.327, as applicable. Pursuant to 2 C.F.R. § 200.327 and Appendix II to Part 200 of Title 2 of the C.F.R.:

i. Contracts for more than $250,000 must address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as appropriate.

ii. All contracts in excess of $10,000 must address termination for cause and for convenience by the State, including the manner by which it will be effected and the basis for settlement.

iii. Except as otherwise provided under 41 C.F.R. Part 60, all contracts that meet the definition of "federally assisted construction contract" in 41 C.F.R. Part 60-1.3 must include the equal opportunity clause provided under 41 C.F.R. 60-1.4(b), in accordance with Executive Order 11246, "Equal Employment Opportunity" (30 FR 12319, 12935, 3 CFR Part, 1964-1965 Comp., p.339), as amended by Executive Order 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," and implementing regulations at 41 C.F.R. Part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor."

iv. When required by federal program legislation, all prime construction contracts in excess of $2,000 awarded by non-federal entities must include a provision for compliance with the Davis-Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 C.F.R. Part 5, "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction"). In accordance with the statute,

[2] Section II is based on requirements set forth in Treasury's Assurance of Compliance with Civil Rights Requirements document, executed by the State on July 26, 2021.

contractors must be required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must be required to pay wages not less than once a week. The non-federal entity must place a copy of the current prevailing wage determination issued by the Department of Labor in each solicitation. The decision to award a contract must be conditioned upon the acceptance of the wage determination. The non-federal entity must report all suspected or reported violations to the federal awarding agency. The contracts must also include a provision for compliance with the Copeland "Anti-Kickback" Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 C.F.R. Part 3, "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States"). The Act provides that each contractor must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. The non-federal entity must report all suspected or reported violations to the federal awarding agency.

v. Where applicable, all contracts awarded by the non-federal entity in excess of $100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Contract Work Hours and Safety Standards Act, each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.[3]

vi. If the State or Contractor wishes to enter into a contract or subcontract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under the State's award of ARPA funds or this agreement, the State and/or Contractor must comply with the requirements of 37 C.F.R. Part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by the awarding agency.

vii. Contracts and subgrants of amounts in excess of $150,000 must contain a provision that requires the non-federal award to agree to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations must be reported to the

[3] Additionally, "in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in [29 C.F.R.] § 5.1," 29 C.F.R. § 5.5(c) requires that another clause be included "in any such contract," *id*. For language appropriate to construction of this additional clause, see 29 C.F.R. § 5.5(c).

Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA). [

viii. A contract award (see 2 CFR 180.220) must not be made to parties listed on the governmentwide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 C.F.R. 180 that implement Executive Orders 12549 (3 C.F.R. Part 1986 Comp., p. 189) and 12689 (3 C.F.R. Part 1989 Comp., p. 235), "Debarment and Suspension." SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549. This requirement applies when the amount of the agreement is expected to equal or exceed $25,000, or if the agreement is for federally-required audit services. 2 C.F.R. § 180.220.]

ix. Contractors that apply or bid for an award exceeding $100,000 must file the certification required by 31 U.S.C. § 1352, the Byrd Anti-Lobbying Amendment. Under that law, each tier certifies to the tier above that it will not and has not used federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any federal contract, grant or any other award covered by 31 U.S.C. § 1352. Each tier must also disclose any lobbying with non-federal funds that takes place in connection with obtaining any federal award. Such disclosures are forwarded from tier to tier up to the non-federal award.

x. A non-federal entity that is a state agency or agency of a political subdivision of a state and its contractors must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR Part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds $10,000 or the value of the quantity acquired during the preceding fiscal year exceeded $10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines. In the performance of this agreement, Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired: 1. competitively within a timeframe providing for compliance with this agreement's performance schedule; 2. meeting this agreement's performance requirements; or 3. at a reasonable price. Information about this requirement, along with the list of EPA-designated items, is available at EPA's Comprehensive Procurement Guidelines webpage: http://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program. Contractor also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act.

xi. Pursuant to Pub. L. No. 115-232, H.R. 5515 (115th Congress, 2018), and 2 C.F.R. § 200.216, funds provided by this agreement shall not be obligated or expended to: 1. Procure or obtain; 2. Extend or renew a contract to procure or obtain; or 3. Enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that uses covered

telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. For purposes of this prohibition, "covered telecommunications equipment or services" has the meaning as set forth at Sec. 889(f)(3) of Pub. L. No. 115-232. *See also* 2 C.F.R. § 200.216.

xii. Pursuant to 2 C.F.R. § 200.322, as appropriate and to the extent consistent with law, Contractor should, to the greatest extent practicable under this agreement, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). For purposes of this provision: 1. "produced in the United States" means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States. 2. "manufactured products" means items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

Missouri
Division of Labor Standards
WAGE AND HOUR SECTION

MICHAEL L. PARSON, Governor

Annual Wage Order No. 31

Section 112
VERNON COUNTY

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

Original Signed by
Todd Smith, Director
Division of Labor Standards

Filed With Secretary of State: **March 8, 2024**

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

Prepared by Missouri Department of Labor and Industrial Relations

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Asbestos Worker	$24.32
Boilermaker	$25.34*
Bricklayer-Stone Mason	$25.34*
Carpenter	$59.26
Lather	
Linoleum Layer	
Millwright	
Pile Driver	
Cement Mason	$25.34*
Plasterer	
Communication Technician	$25.34*
Electrician (Inside Wireman)	$25.34*
Electrician Outside Lineman	$25.34*
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Elevator Constructor	$25.34*
Glazier	$25.34*
Ironworker	$67.05
Laborer	$25.34*
General Laborer	
First Semi-Skilled	
Second Semi-Skilled	
Mason	$25.34*
Marble Mason	
Marble Finisher	
Terrazzo Worker	
Terrazzo Finisher	
Tile Setter	
Tile Finisher	
Operating Engineer	$25.34*
Group I	
Group II	
Group III	
Group III-A	
Group IV	
Group V	
Painter	$25.34*
Plumber	$79.23
Pipe Fitter	
Roofer	$25.34*
Sheet Metal Worker	$25.34*
Sprinkler Fitter	$25.34*
Truck Driver	$25.34*
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

*The Division of Labor Standards received fewer than 1,000 reportable hours for this occupational title. The public works contracting minimum wage is established for this occupational title using data provided by Missouri Economic Research and Information Center.
**The Prevailing Hourly Rate includes any applicable fringe benefit amounts for each occupational title as defined in RSMo Section 290.210.

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Carpenter	$25.34*
Millwright	
Pile Driver	
Electrician (Outside Lineman)	$25.34*
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Laborer	$43.44
General Laborer	
Skilled Laborer	
Operating Engineer	$52.00
Group I	
Group II	
Group III	
Group IV	
Truck Driver	$25.34*
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

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

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

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

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

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

OVERTIME
and
HOLIDAYS

OVERTIME

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

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

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

HOLIDAYS

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

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

SECTION 011000
SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. The Project consists of sanitary sewer system improvements at Camp Clark in Nevada, MO.

1. Project Location: 18159 South K Highway, Nevada, MO 64772

2. Owner: Missouri Army National Guard, 6819-B North Boundary Road, Jefferson City, Missouri 65101.

B. Contract Documents dated June 14, 2024 were prepared for the Project by Allgeier, Martin and Associates, Inc., Inc., 7231 East 24th Street, Joplin, Missouri 65804-3485.

C. The Base Bid Work includes demolishing the existing wastewater treatment lagoons, building a lift station, and installing approximately 7,964 L.F. of 6” diameter pressure sewer pipe to send all on-site sewage to the City of Nevada’s sanitary sewer system.

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

1.3 WORK UNDER OTHER CONTRACTS

A. Separate Contract: No work under separate contract is contemplated, although the Owner reserves the right to do Work within the project site.

1.4 FUTURE WORK

A. Future Contract: No work under future contract is contemplated.

1.5 WORK SEQUENCE

A. Where Work is on or adjacent to existing facilities, exercise caution and schedule operations to ensure that functions of operating facilities will not be endangered. Shutdown of Owner’s operating facilities to perform Work shall be held to a minimum length of time and shall be coordinated with Owner who shall have control over the timing and schedules of such shutdowns.

1.6 CONTRACTOR USE OF PREMISES

A. General: During the construction period the Contractor shall have full use of the premises for construction operations, including use of the site. The Contractor’s use of the premises is limited only by the Owner’s right to perform work or to retain other contractors on portions of the Project.

B. Use of the Site: Limit use of the premises to work in areas indicated. Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.

1. Owner Occupancy: Allow for Owner use of the site.

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

1.7 CONSTRUCTION SURVEYS

A. Survey control and reference points which, in the Engineer's opinion, are necessary to enable Contractor to perform the Work are indicated on the drawings. Contractor shall locate and protect survey control and reference points and be responsible for laying out the Work. Elevations shown on the drawings and referenced in the specifications are based on the benchmarks shown.

B. Contractor shall perform all construction staking and surveying he may find necessary or convenient to enable construction of each element of the Work in the correct position to correspond with the information shown on the drawings. All construction staking shall be done under the direct supervision of a Registered Land Surveyor with the State of Missouri.

C. Contractor shall be responsible for the preservation of all benchmarks and control monuments, property corners, and public corners within, or adjacent to, the project limits. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by a Registered Land Surveyor with the State of Missouri.

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 1 Specification Sections apply to this Section.

1.2 SUMMARY

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

1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements. If necessary, additional requirements will be issued by Contract Change.

B. Types of allowances include the following:

1. Weather allowances.

C. Related Sections include the following:

1. Division 1 Section "Contract Modification Procedures" for procedures for submitting and handling Contract Changes 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 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 Contract Change time extension will be executed for “bad weather” days, as defined above, encountered during the remainder of the Project.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALLOWANCES

A. Weather Allowance: Included within the completion period of one hundred thirty (130) working days for this Project are twenty (20) “bad weather” days.

END OF SECTION 012100

SECTION 012200
UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Quantities of Units to be included in the Base Bid are indicated in Section 004322 – Unit Prices.

1.2 SUMMARY

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

B. Related Sections include the following:

1. Division 1 Section "Allowances" for procedures for using Unit Prices to adjust quantity allowances.

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

1.3 DEFINITIONS

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

1.4 PROCEDURES

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

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

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

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

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 LIST OF UNIT PRICES

A. Unit Price No. 1: Installation of 6-Inch Diameter PVC Pressure Sewer Line:

1. Description: 6-Inch Diameter PVC Pressure Sewer Line, Including Trenching, Bedding, Backfill, and Pipe Material, according to Division 33 Section 330518 “Pressure Pipe and Fittings” and Division 33 Section 333416 “Pressure Pipe Installation.”

2. Unit of Measurement: Linear feet of 6-Inch Diameter PVC Pressure Sewer Line Installed

3. Base Bid Quantity: 7,964 linear feet.

END OF SECTION 012200

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 0, Section 007213, Article 3.1 "Acceptable Substitutions" for administrative procedures for handling Requests for Substitutions made after Contract award.

3. Division 0, Section 007213, Article 4.0 "Changes in the Work" for Contract Change 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 an RFI will cause a change to the requirements of the Contract Document, the Contractor shall give written notice to the Designer requesting a Contract Change 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 Contract Change Detailed Breakdown form. Subcontractors may use the appropriate Contract Change 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 CONTRACT CHANGE PROCEDURES

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

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 REFERENCED FORMS

A. The following forms can be found on our website at https://oa.mo.gov/facilities/vendor-links/architectengineering-forms or https://oa.mo.gov/facilities/vendor-links/contractor-forms:

1. Request for Information
2. Designer’s Supplemental Instructions
3. Request for Proposal
4. Contract Change
5. Contract Change Detailed Breakdown – SAMPLES
6. Contract Change Detailed Breakdown – General Contractor (GC)
7. Contract Change Detailed Breakdown – Subcontractor (SUB)

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. Key Personnel Names: Within fifteen (15) workdays 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 Contract Changes

    e. Purchases

    f. Deliveries

    g. Submittals

    h. Review of mockups

    i. Possible conflicts

    j. Compatibility problems

    k. Time schedules

    l. Weather limitations

    m. Manufacturer's written recommendations

    n. Warranty requirements

    o. Compatibility of materials

    p. Acceptability of substrates

    q. Temporary facilities and controls

    r. Space and access limitations

    s. Regulations of authorities having jurisdiction

    t. Testing and inspecting requirements

    u. Installation procedures

    v. Coordination with other Work

    w. Required performance results

    x. Protection of adjacent Work

    y. Protection of construction and personnel

3. Contractor shall record significant conference discussions, agreements, and disagreements including required corrective measures and actions.

4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.

5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

6. Revise paragraph below if Project requires holding progress meetings at different intervals. Insert special intervals such as "every third Tuesday" to suit special circumstances.
7. Project name
8. Name and address of Contractor
9. Name and address of Designer
10. RFI number including RFIs that were dropped and not submitted
11. RFI description
12. Date the RFI was submitted
13. Date Designer's response was received
14. Identification of related DSI or Proposal Request, as appropriate

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION - (Not Used)

END OF SECTION 013100

SECTION 013115
PROJECT MANAGEMENT COMMUNICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Division 1, Section 013300 - Submittals

C. Division 1, Section 012600 – Contract Modification Procedures

1.2 SUMMARY

A. Project Management Communications: The Contractor shall use the Internet web based project management communications tool, E-Builder® ASP software, and protocols included in that software during this project. The use of project management communications as herein described does not replace or change any contractual responsibilities of the participants.

1. Project management communications is available through E-Builder® as provided by "e-Builder®" in the form and manner required by the Owner.

2. The project communications database is on-line and fully functional. User registration, electronic and computer equipment, and Internet connections are the responsibility of each project participant. The sharing of user accounts is prohibited

B. Support: E-Builder® will provide on-going support through on-line help files.

C. Copyrights and Ownership: Nothing in this specification or the subsequent communications supersedes the parties' obligations and rights for copyright or document ownership as established by the Contract Documents. The use of CAD files, processes or design information distributed in this system is intended only for the project specified herein.

D. Purpose: The intent of using E-Builder® is to improve project work efforts by promoting timely initial communications and responses. Secondly, to reduce the number of paper documents while providing improved record keeping by creation of electronic document files

E. Authorized Users: Access to the web site will be by individuals who are authorized users.

1. Individuals shall complete the E-Builder New Company/User Request Form located at the following web site: https://oa.mo.gov/facilities/vendor-links/contractor-forms. Completed forms shall be emailed to the following email address: OA.FMDCE-BuilderSupport@oa.mo.gov.

2. Authorized users will be contacted directly and assigned a temporary user password.

3. Individuals shall be responsible for the proper use of their passwords and access to data as agents of the company in which they are employed.

F. Administrative Users: Administrative users have access and control of user licenses and all posted items. DO NOT POST PRIVATE OR YOUR COMPANY CONFIDENTIAL ITEMS IN THE DATABASE! Improper or abusive language toward any party or repeated posting of items intended to deceive or disrupt the work of the project will not be tolerated and will result in deletion of the offensive items and revocation of user license at the sole discretion of the Administrative User(s).

G. Communications: The use of fax, email and courier communication for this project is discouraged in favor of using E-Builder® to send messages. Communication functions are as follows:

1. Document Integrity and Revisions:

   a. Documents, comments, drawings and other records posted to the system shall remain for the project record. The authorship time and date shall be recorded for each document submitted to the system. Submitting a new document or record with a unique ID, authorship, and time stamp shall be the method used to make modifications or corrections.

   b. The system shall make it easy to identify revised or superseded documents and their predecessors.

   c. Server or Client side software enhancements during the life of the project shall not alter or restrict the content of data published by the system. System upgrades shall not affect access to older documents or software.

2. Document Security:

   a. The system shall provide a method for communication of documents. Documents shall allow security group assignment to respect the contractual parties communication except for Administrative Users. DO NOT POST PRIVATE OR YOUR COMPANY CONFIDENTIAL ITEMS IN THE DATABASE!

3. Document Integration:

   a. Documents of various types shall be logically related to one another and discoverable. For example, requests for information, daily field reports, supplemental sketches and photographs shall be capable of reference as related records.

4. Reporting:

   a. The system shall be capable of generating reports for work in progress, and logs for each document type. Summary reports generated by the system shall be available for team members.

5. Notifications and Distribution:

   a. Document distribution to project members shall be accomplished both within the extranet system and via email as appropriate. Project document distribution to parties outside of the project communication system shall be accomplished by secure email of outgoing documents and attachments, readable by a standard email client.

6. Required Document Types:

   a. RFI, Request for Information.

   b. Submittals, including record numbering by drawing and specification section.

c. Transmittals, including record of documents and materials delivered in hard copy.

d. Meeting Minutes.

e. Application for Payments (Draft or Pencil).

f. Review Comments.

g. Field Reports.

h. Construction Photographs.

i. Drawings.

j. Supplemental Sketches.

k. Schedules.

l. Specifications.

m. Request for Proposals

n. Designer's Supplemental Instructions

o. Punch Lists

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

1. 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.

2. 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.

3. The Owner and his representatives, the Designer and his consultants, and the Contractor and his Sub Contractors and suppliers at every tier reserves the right to and shall copy any paper document into electronic form and make same available on the web site.

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

1. Providing suitable computer systems for each licensed user at the users normal work location[1] with high-speed Internet access, i.e. DSL, local cable company's Internet connection, or T1 connection.

2. Each of the above referenced computer systems shall have the following minimum system[2] and software requirements:

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

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

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 Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013115

SECTION 013200
SCHEDULES – 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 Used)

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 within (15) days of the date established for commencement of the Contract Work. The Contractor is to notify the testing agency at least (5) working days in advance of the required tests unless otherwise specified.

B. Form: This schedule shall be in tabular form and shall include, but not be limited to, the following:

1. Specification Section number

2. Description of the test

3. Identification of applicable standards

4. Identification of test methods

5. Number of tests required

6. Time schedule or time span for tests

7. Entity responsible for performing tests

8. Requirements for taking samples

9. Unique characteristics of each service

C. Distribution: Distribute the schedule to the Owner, Architect, and each party involved in performance of portions of the Work where inspections and tests are required.

END OF SECTION 013200

SECTION 013300
SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Division 1, Section 013115 “Project Management Communications” for administrative requirements for communications.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submittals required for performance of the Work including the following:

1. Shop Drawings
2. Product Data
3. Samples
4. Quality Assurance Submittals
5. Construction Photographs
6. Operating and Maintenance Manuals
7. Warranties

B. Administrative Submittals: Refer to General and Supplementary Conditions, other applicable Division 1 Sections, and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following:

1. Construction Progress Schedule including Schedule of Values
2. Performance and Payment Bonds
3. Insurance Certificates
4. Applications for Payment
5. Certified Payroll Reports
6. Partial and Final Receipt of Payment and Release Forms
7. Affidavit – Compliance with Prevailing Wage Law
8. Record Drawings
9. Notifications, Permits, etc.

C. The Contractor is obliged and responsible to check all shop drawings and schedules to assure compliance with contract plans and specifications. The Contractor is responsible for the content of the shop drawings and coordination with other contract work. Shop drawings and schedules shall indicate, in detail, all parts of an Item or Work including erection and setting instructions and integration with the Work of other trades.

D. The Contractor shall make a copy of all approved submittals available on site to the Construction Representative.

1.3 SUBMITTAL PROCEDURES

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

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

2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.

    a. The Designer reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.

B. Each drawing and/or series of drawings submitted must be accompanied by a letter of transmittal giving a list of the titles and numbers of the drawings. Each series shall be numbered consecutively for ready reference and each drawing shall be marked with the following information:

1. Date of Submission
2. Name of Project
3. Location
4. Section Number of Specification
5. State Project Number
6. Name of Submitting Contractor
7. Name of Subcontractor
8. Indicate if Item is submitted as specified or as a substitution

1.4 SHOP DRAWINGS

A. Comply with the General Conditions, Article 3.2.

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

C. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates, and similar drawings including the following information:

1. Dimensions
2. Identification of products and materials included by sheet and detail number
3. Compliance with specified standards
4. Notation of coordination requirements
5. Notation of dimensions established by field measurement
6. Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8½”x11” but no larger than 36”x48”.

1.5 PRODUCT DATA

A. The Contractor shall comply with the General Conditions, Article 3.2.

B. The Contractor shall collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information, such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves.

1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products that are not required, mark copies to indicate the applicable information including the following information:

a. Manufacturer's printed recommendations

b. Compliance with Trade Association standards

c. Compliance with recognized Testing Agency standards

d. Application of Testing Agency labels and seals

e. Notation of dimensions verified by field measurement

f. Notation of coordination requirements

2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

1.6 SAMPLES

A. The Contractor shall comply with the General Conditions, Article 3.2.

B. The Contractor shall submit full-size, fully fabricated samples, cured and finished as specified, and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern.

1. The Contractor shall mount or display samples in the manner to facilitate review of qualities indicated. Prepare samples to match the Designer's sample including the following:

a. Specification Section number and reference

b. Generic description of the Sample

c. Sample source

d. Product name or name of the Manufacturer

e. Compliance with recognized standards

f. Availability and delivery time

2. The Contractor shall submit samples for review of size, kind, color, pattern, and texture. Submit samples for a final check of these characteristics with other elements and a comparison of these characteristics between the final submittal and the actual component as delivered and installed.

a. Where variation in color, pattern, texture, or other characteristic is inherent in the material or product represented, submit at least three (3) multiple units that show approximate limits of the variations.

b. Refer to other Specification Sections for requirements for samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.

c. Refer to other Sections for samples to be returned to the Contractor for incorporation in the Work. Such samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of sample submittals.

d. Samples not incorporated into the Work, or otherwise designated as the Owner's property, are the property of the Contractor and shall be removed from the site prior to Substantial Completion.

3. Field samples are full-size examples erected onsite to illustrate finishes, coatings, or finish materials and to establish the Project standard.

a. The Contractor shall comply with submittal requirements to the fullest extent possible. The Contractor shall process transmittal forms to provide a record of activity.

1.7 QUALITY ASSURANCE DOCUMENTS

A. The Contractor shall comply with the General Conditions, Article 3.2

B. The Contractor shall submit quality control submittals including design data, certifications, manufacturer's instructions, manufacturer's field reports, and other quality-control submittals as required under other Sections of the Specifications.

C. Certifications: Where other Sections of the Specifications require certification that a product, material, or installation complies with specified requirements, submit a notarized certification from the Manufacturer certifying compliance with specified requirements.

1. Signature: Certification shall be signed by an officer of the Manufacturer or other individual authorized to contractually bind the Company.

D. Inspection and Test Reports: The Contractor shall submit the required inspection and test reports from independent testing agencies as specified in this Section and in other Sections of the Contract Documents.

E. Construction Photographs: The Contractor shall submit record construction photographs as specified in this Section and in other Sections of the Contract Documents.

1. The Contractor shall submit digital photographs. The Construction Administrator shall determine the quantity and naming convention at the preconstruction meeting.

2. The Contractor shall identify each photograph with project name, location, number, date, time, and orientation.

3. The Contractor shall submit progress photographs monthly unless specified otherwise. Photographs shall be taken one (1) week prior to submitting.

4. The Contractor shall take four (4) site photographs from differing directions and a minimum of five (5) interior photographs indicating the relative progress of the Work.

1.8 OPERATING AND MAINTENANCE MANUALS AND WARRANTIES

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

PART 2 - PRODUCTS - (Not Used)

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
013100	Key Personnel Names & Assignments	Information Submittal
013200	Schedules	Construction Schedule
013200	Schedules	Schedule of Values
013200	Schedules	List of Subcontractors
013200	Schedules	Major Material Suppliers
013513.28	Scheduled Shutdowns	Information Submittal
013513.28	Employee Information - Background Check	Information Submittal
015723	Stormwater Pollution Prevention Plan	Information Submittal
024119	Demolition Work	Schedule
031000	Concrete Formwork Accessories	Product Data
032000	Concrete Reinforcing	Shop Drawings
033110	Concrete Materials and Proportioning	Shop Drawings
083113.13	Vault Access Doors	Shop Drawings
260500	Electrical Materials	Product Data
262816	Electrical Equipment	Shop Drawings
312300	Fill and Backfill Material	Test Report
312316	Granular Materials	Test Report
312333	Granular Embedment Material	Test Report
313700	Bedding Aggregate	Test Report
320117	Pavement Repair Products & Materials	Shop Drawings
321540	Aggregate Surfacing Products & Materials	Shop Drawings
329200	Seed, Fertilizer & Soil Analysis	Information Submittal
330130.81	Flow Diversion & Notification Plan	Information Submittal
330516	Manholes, Vaults and Appurtenances	Shop Drawings
330517	Pipe and Fittings	Product Data
330518	Pipe and Fittings	Product Data
330526	Marking Tape, Tracer Wire & Appurtenances	Product Data
330529	Utility Valves and Accessories	Shop Drawings
407113	Flow Meter	Product Data
407113	Flow Meter	Operation / Maintenance Manual
444629.13	Pumps, Controls and Appurtenances	Shop Drawings
444629.13	Pumps, Controls and Appurtenances	Operation / Maintenance Manual

END OF SECTION 013300

SECTION 013513.28
SITE SECURITY AND HEALTH REQUIREMENTS

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 brough on site.

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 Used)

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.

1. Onsite burning is prohibited.

2. The Contractor shall store all flammable or hazardous materials in proper containers located outside the buildings or offsite, if possible.

3. The Contractor shall provide and maintain, in good order, during construction fire extinguishers as required by the National Fire Protection Association. In areas of flammable liquids, asphalt, or electrical hazards, 15-pound carbon dioxide or 20-

pound dry chemical extinguishers shall be provided.

B. The Contractor shall not obstruct streets or walks without permission from the Owner's Construction Representative and Facility Representatives.

C. The Contractor's personnel shall not exceed the speed limit of 15 mph while at the Facility unless otherwise posted.

D. The Contractor shall take all necessary, reasonable measures to reduce air and water pollution by any material or equipment used during construction. The Contractor shall keep volatile wastes in covered containers, and shall not dispose of volatile wastes or oils in storm or sanitary drains.

E. The Contractor shall keep the project site neat, orderly, and in a safe condition at all times. The Contractor shall immediately remove all hazardous waste, and shall not allow rubbish to accumulate. The Contractor shall provide onsite containers for collection of rubbish and shall dispose of it at frequent intervals during the progress of the Work.

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 SECURITY CLEARANCES AND RESTRICTIONS

A. FMDC REQUIRED FINGERPRINTING FOR CRIMINAL BACKGROUND AND WARRANTS CHECK

1. All employees of the Contractor are required to submit fingerprints to the Missouri State Highway Patrol to enable the Office of Administration, Division of Facilities Management, Design and Construction (FMDC) to receive state and national criminal background checks on such employees. FMDC reserves the right to prohibit any employee of the Contractor from performing work in or on the premises of any facility owned, operated, or utilized by the State of Missouri for any reason.

2. The Contractor shall ensure all of its employees submit fingerprints to the Missouri State Highway Patrol and pay for the cost of such background checks. The Contractor shall submit to FMDC via email to FMDCSecurity@oa.mo.gov a list of the names of the Contractor's employees who will be fingerprinted and a signed Missouri Applicant Fingerprint Privacy Notice, Applicant Privacy Rights and Privacy Act Statement for each employee. All employees of the Contractor approved by FMDC to work at a State facility must obtain a contractor ID badge from FMDC prior to beginning work on-site, unless the Director of FMDC, at the Director's discretion, waives the requirement for a contractor ID badge. The Contractor and its employees must comply with the process for background checks and contractor ID badges found on FMDC's website at: https://oa.mo.gov/fmdc-contractor-id-badges.

3. Pursuant to section 43.540, RSMo, FMDC participates in the Missouri Rap Back and National Rap Back programs as of August 28, 2018. This means that the Missouri State Highway Patrol, Central Records Repository, and the Federal Bureau of Investigation will retain the fingerprints submitted by each of the

Contractor's employees, and those fingerprints will be searched against other fingerprints on file, including latent fingerprints. While retained, an employee's fingerprints may continue to be compared against other fingerprints submitted or retained by the Federal Bureau of Investigation, including latent fingerprints.

4. As part of the Missouri and National Rap Back programs, FMDC will receive notification if a new arrest is reported for an employee whose fingerprints have been submitted for FMDC after August 28, 2018. If the employee is performing work on a State contract at the time of the arrest notification, FMDC will request and receive the employee's updated criminal history records. If the employee is no longer performing work on a State contract, FMDC will not obtain updated criminal records.

5. Pursuant to section 43.540, RSMo, the Missouri State Highway Patrol will provide the results of the employee's background check directly to FMDC. FMDC may NOT release the results of a background check to the Contractor or provide the Contractor any information obtained from a background check, either verbally or in writing. FMDC will notify the Contractor only whether an employee is approved to work on State property.

6. Each employee who submits fingerprints to the Missouri State Highway Patrol has a right to obtain a copy of the results of his or her background check. The employee may challenge the accuracy and completeness of the information contained in a background check report and obtain a determination from the Missouri State Highway Patrol and/or the FBI regarding the validity of such challenge prior to FMDC making a final decision about his or her eligibility to perform work under a State contract.

7. The Contractor shall notify FMDC via email to FMDCSecurity@oa.mo.gov if an employee is terminated or resigns from employment with the Contractor. If the Contractor does not anticipate performing work on a State contract in the future, the Contractor may request that FMDC remove its employees from the Rap Back programs. However, if removed from the Rap Back programs, employees will be required to submit new fingerprints should the contractor be awarded another State contract.

8. Upon award of a Contract, the Contractor should contact FMDC at FMDCSecurity@oa.mo.gov to determine if its employees need to provide a new background check. If a Contractor's employee has previously submitted a fingerprint background check to FMDC as part of the Missouri and National Rap Back programs, the employee may not need to submit another fingerprint search for a period of three to six years, depending upon the circumstances. The Contractor understands and agrees that FMDC may require more frequent background checks without providing any explanation to the Contractor. The fact that an additional background check is requested by FMDC does not indicate that the employee has a criminal record.

3.4 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.

3.5 PROTECTION OF PERSONS AND PROPERTY

A. SAFETY PRECAUTIONS AND PROGRAMS

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

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

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

B. SAFETY OF PERSONS AND PROPERTY

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

   a. clients, staff, the public, construction personnel, and other persons who may be affected thereby;

   b. the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor or the Contractor's Subcontractors of any tier; and

   c. other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

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

3. The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, safeguards for safety and protection, including, but

not limited to, posting danger signs and other warnings against hazards, promulgating safety regulations, and notifying owners and users of adjacent sites and utilities.

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

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

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

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

8. The Contractor shall promptly report in writing to the Owner all accidents arising out of or in connection with the Work which cause death, lost time injury, personal injury, or property damage, giving full details and statements of any witnesses. In addition, if death, serious personal injuries, or serious property damages are caused, the accident shall be reported immediately.

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

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

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

12. The Contractor shall maintain at his own cost and expense, adequate, safe and sufficient walkways, platforms, scaffolds, ladders, hoists and all necessary,

proper, and adequate equipment, apparatus, and appliances useful in carrying on the Work and which are necessary to make the place of Work safe and free from avoidable danger for clients, staff, the public and construction personnel, and as may be required by safety provisions of applicable laws, ordinances, rules regulations and building and construction codes.

END OF SECTION 013513.28

SECTION 011423
WORK RESTRICTIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements pertaining to existing site conditions and shutdown of existing potable water mains, sanitary sewers, and wastewater treatment process units in order to perform Work shown and specified.

1. Existing site conditions are indicated on the Drawings. This depiction notes the locations of existing potable water, sanitary sewer, and service lines based on the best information available. Contractor should assume there may be some variance and/or depth of the existing water, sewer, and service lines.

2. Contractor shall locate all underground installations, including service connections, in advance of excavating or trenching, by providing and utilizing appropriate utility locating equipment, prospecting, or other appropriate locating techniques.

3. Contractor shall verify horizontal and vertical location of existing underground utilities where interference or conflicts could affect proposed pipeline alignment or grade. Modifications to avoid unknown or mislocated facilities should be expected.

B. Related Work:

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

1.2 DEFINITIONS

A. Shutdown: A shutdown is defined as a portion of the normal operation of a pipeline or process unit that has to be taken out of service in order to perform the specified Work.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

A. Water and sewer service to facility buildings shall remain in continuous satisfactory operation during the entire construction period. Any shutdowns shall be scheduled and coordinated with facility management and kept to an absolute minimum time frame.

B. Contractor shall utilize methods, techniques, and equipment necessary to maintain unrestricted flow of wastewater during construction. Wastewater shall not be allowed to overflow from manholes or open excavations onto the ground surface. All wastewater shall be directed to downstream sewer line sections by bypass pumping.

C. Regulatory discharge requirements for wastewater treatment lagoon effluent mandate continuous and adequate treatment of wastewater. Contractor’s means and methods shall be implemented such that the existing lagoons shall remain in continuous satisfactory operation during the entire construction period.

D. Contractor shall schedule and perform the Work in such a manner that results in the least possible disruption to existing treatment operations.

END OF SECTION 011423

SECTION 014200
DEFINITIONS AND STANDARDS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes definitions of terms and symbols used in the Contract Documents, explanation of specification format and content, and establishes edition dates for standards referenced elsewhere in the specifications.

B. Related Requirements:

1. Section 007213 - General Conditions

1.2 DEFINITIONS

A. General Explanation: A substantial amount of specification language constitutes definitions for terms found in other contract documents, including drawings which must be recognized as diagrammatic in nature and not completely descriptive of requirements indicated thereon. Certain terms used in the Contract Documents are defined generally in this section. Definitions and explanations of this section are not necessarily complete or exclusive but are general for the Work to the extent not stated more explicitly in another provision of the Contract Documents.

1. “General Requirements” are the provisions or requirements of the DIVISION 1 Sections, and which apply to the entire work of the Contract.

2. The term “indicated” is a cross-reference to graphics, notes or schedules on drawings, to other paragraphs or schedules in the specifications, and to similar means of recording requirements in Contract Documents. Where terms such as “shown”, “noted”, “scheduled”, and “specified” are used in lieu of “indicated”, it is for purpose of helping reader locate cross-reference, and no limitation of location is intended except as specifically noted.

3. Where not otherwise explained, terms such as “directed”, “requested”, “authorized”, “selected”, “approved”, “required”, “accepted”, and permitted”, mean “directed by Engineer”, “requested by Engineer”, etc. However, no such implied meaning will be interpreted to extend Engineer’s responsibility into Contractor’s area of construction supervision.

4. Where used in conjunction with Engineer’s response to submittals, requests, applications, inquiries, reports and claims by Contractor, the meaning of the term “approved” will be held to limitations of Engineer’s responsibilities and duties as specified in the General Conditions and Supplemental General Conditions. In no case will “approval” by Engineer be interpreted as a release of Contractor from responsibilities to fulfill requirements of Contract Documents.

5. “Project Site” is the area available to the Contractor for performance of the Work, either exclusively or in conjunction with others performing other work as part of the project. The extent of the project site is shown on the drawings and may or may not be identical with description of land upon which project is to be built.

6. When applied to equipment and materials, the words “furnish”, “install” and “provide” shall mean the following:

a. The word “furnish” shall mean to supply, pay for, and deliver to project site, ready for assembly, installation, etc., as applicable in each instance.

b. The word “install” shall mean to assemble, erect, place into position, incorporate into the Work, adjust, clean and make fit for intended use, as applicable in each instance.

c. The word “provide” shall mean to furnish and install, complete and ready for intended use, as applicable in each instance.

7. “Installer” shall mean the entity (person or firm) engaged by Contractor or its subcontractor (at any lower tier) for performance of a particular unit of work at project site, including installation, erection, application, and similar required operations. It is a general requirement that such entities (Installers) be expert in operations they are engaged to perform.

8. “Testing Laboratory” shall mean an independent entity engaged to perform specific inspections or tests of the Work, either at the project site or elsewhere; and to report and (if required) interpret results of those inspections or tests.

B. Basic contract terms used in the Contract Documents are defined in the GENERAL CONDITIONS.

1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATIONS

A. Specification Format: These specifications are organized into Divisions and Sections based on the Construction Specifications Institute’s MasterFormat® numbers and titles. Some portions may not fully comply, and no particular significance will be attached to such compliance or non-compliance.

1. Divisions and Sections: For convenience, basic unit of specification text is a “section”, each unit of which is numbered and named. These are organized into related families of sections, and various families of sections are organized into “divisions”, which are recognized as the present industry consensus on uniform organization and sequencing of specifications. The section title is not intended to limit meaning or content of section, nor to be fully descriptive of requirements specified therein, nor to be an integral part of text.

2. Section Numbering: Used to facilitate cross-references in Contract Documents. Sections are organized in numerical sequence; however, numbering sequence is not complete, and listing of sections in Index at beginning of Contract Documents must be consulted to determine numbers and names of specification sections in Contract Documents.

3. Page Numbering: Numbered independently for each section. Section number is shown with page number at bottom of each page, to facilitate location of text.

4. Parts: Each section of specifications generally has been subdivided into three basic “parts” for uniformity and convenience (Part 1 - General, Part 2 - Products and Part 3 - Execution). These titles do not limit the meaning of text within. Some sections may not contain all three parts when not applicable.

B. Specification Content: ese specifications use certain general characteristics of content and conventions in the use of language which are explained as follows:

1. Imperative Language: These specifications are written in imperative and abbreviated form. Unless specifically stated otherwise, this imperative language is directed at the Contractor. Incomplete sentences shall be completed by inserting “shall”, “the Contractor shall”, “shall be”, and similar mandatory phrases by inference in the same manner as they are applied to notes on the drawings.

2. Specifying Methods: The techniques or methods of specifying to record requirements varies throughout text, and may include “prescriptive”, “compliance with standards”, “performance”, “proprietary”, or a combination of these. The method used for specifying one unit of work has no bearing on requirements for another unit of work.

3. Abbreviations: The language of these specifications and other Contract Documents is of the abbreviated type in certain instances and implies words and meanings which will be appropriately interpreted. Specific abbreviations are frequently used for trade association names and titles of general standards.

C. Assignment of Specialists: In certain instances, specification text requires that specific work be assigned to specialists or expert entities, who must be engaged for performance of those units of work. These must be recognized as special requirements over which Contractor has no choice or option. These assignments must not be confused with, and are not intended to interfere with, normal application of regulations, union jurisdictions and similar conventions. One purpose of such assignments is to establish which party or entity involved in a specific unit of work is recognized as “expert” for indicated construction processes or operations. Nevertheless, final responsibility for fulfillment of contract requirements remains with the Contractor.

D. Trades: Except as otherwise indicated, the use of titles such as “carpentry” in specification text implies neither that the work must be performed by an accredited or unionized tradesperson of corresponding generic name (such as “carpenter”), nor that specified requirements apply exclusively to work by tradespersons of that corresponding generic name.

1.4 DRAWING SYMBOLS

A. Except as otherwise indicated, graphics symbols used on drawings are those symbols recognized in the construction industry for purposes indicated. Refer instances of uncertainty to Engineer for clarification.

1.5 INDUSTRY STANDARDS

A. General Applicability of Standards: Except where the Contract Documents include more stringent requirements, applicable standards of the construction industry have the same force and affect and are made a part of the Contract Documents by reference as if copied directly into the Contract Documents, or as if published copies were bound herewith.

1. Referenced standards, referenced directly in Contract Documents or by governing regulations, have precedence over non-referenced standards which are recognized in industry for applicability to work.

2. Where compliance with an industry standard is required, comply with standard in effect as of the date of the Contract Documents.

3. Where compliance with two or more industry standards or sets of requirements is specified and overlapping of these different standards or requirements establishes different or conflicting minimums or levels of quality, the most stringent requirement will be enforced. Refer apparently equal but different requirements, and uncertainties as to which level of quality is more stringent to Engineer for a decision before proceeding.

4. In every instance, quality level or quantity shown or specified is intended as minimum for the work to be performed or provided. Except as otherwise specifically indicated, actual work may either comply exactly with that minimum, within specified tolerances, or may exceed that minimum within reasonable limits. In complying with requirements, indicated numeric values are either minimums or maximums as noted or as appropriate for context of

requirements. Refer instances of uncertainty to Engineer for decision before proceeding.

5. Each entity engaged in construction activities on the Project shall be familiar with the industry standards applicable to their work. Where copies of standards are needed for proper performance of the work, the Contractor shall obtain copies directly from the publication source.

B. Abbreviations and Names: Trade association names and titles of general standards are generally abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they are defined to mean the industry recognized name of trade association, standards generating organization, governing authority or other entity applicable to context of text provision.

PART 2 - PRODUCTS – (Not Used)

PART 3 - EXECUTION – (Not Used)

END OF SECTION 014200

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. Temporary electric power
2. Temporary heat
3. Ventilation
4. Sanitary facilities, including drinking water

C. Support facilities include, but are not limited to, the following:

1. Storage sheds
2. Dewatering facilities and drains
3. Temporary enclosures
4. Waste disposal services
5. Construction aids and miscellaneous services and facilities

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

1. Barricades, warning signs, and lights
2. Environmental protection

1.3 SUBMITTALS

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

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

1.4 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations including, but not limited to, the following:

1. Building code requirements
2. Health and safety regulations
3. Utility company regulations
4. Police, fire department, and rescue squad rules

5. Environmental protection regulations

B. Standards: Comply with NFPA 241 “Standard for Safeguarding Construction, Alterations, and Demolition Operations”. ANSI A10 Series standards for “Safety Requirements for Construction and Demolition”, and NECA Electrical Design Library “Temporary Electrical Facilities”.

1. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70 “National Electric Code”.

C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.5 PROJECT CONDITIONS

A. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of permanent service.

B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the Work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire-prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist onsite.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide new materials. If acceptable to the Designer, the Contractor may use undamaged, previously used materials in serviceable condition. Provide materials suitable for use intended.

B. Tarpaulins: Provide waterproof, fire-resistant, UL-labeled tarpaulins with flame-spread rating of (15) or less. For temporary enclosures, provide translucent, nylon-reinforced laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins. G. Water: Provide potable water approved by local health authorities.

2.2 EQUIPMENT

A. General: Provide new equipment. If acceptable to the Designer, the Contractor may use undamaged, previously used equipment in serviceable condition. Provide equipment suitable for use intended.

B. Water Hoses: Provide ¾” (19mm), heavy-duty, abrasion-resistant, flexible rubber hoses 100’ (30m) long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.

C. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110 to 120V plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.

D. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage rating.

E. 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.

F. 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. 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 Contract Change.

B. Temporary Water Service: The Owner will provide water for construction purposes from the existing distribution 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: The Owner will provide electric power for construction lighting and power tools. Contractors using such services shall pay all costs of temporary services, circuits, outlet, extensions, etc.

D. Temporary Heating: Provide temporary heat required by construction activities for curing or drying of completed installations or for protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.

1. Heating Facilities: Except where the Owner authorizes use of the permanent system, provide vented, self-contained, LP gas or fuel-oil heaters with individual space thermostatic control.

2. Use of gasoline-burning space heaters, open flame, or salamander heating units is prohibited.

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. Drinking-Water Facilities: Provide containerized, tap-dispenser, bottled-water drinking water units, including paper supply.

1. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45°F to 55°F (7°C to 13°C).

G. 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 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. Storage facilities: Install storage sheds sized, furnished, and equipped to accommodate materials and equipment involved. Sheds may be open shelters or fully enclosed spaces as appropriate.

C. Storage Facilities: On site material storage shall be permitted and the location(s) will be provided at the Pre-Construction Meeting.

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

E. 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 31 Sections. Where feasible, utilize the same facilities. Maintain the site, excavations, and construction free of water.

F. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities.

1. Where heat is needed provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and materials drying or curing requirements to avoid dangerous conditions and effects.

2. Install tarpaulins securely with incombustible wood framing and other materials. Close openings of 25SqFt (2.3SqM) or less with plywood or similar materials.

3. Close openings through floor or roof decks and horizontal surfaces with loadbearing, wood-framed construction.

4. Where temporary wood or plywood enclosure exceeds 100SqFt (9.2SqM) in area, use UL-labeled, fire-retardant-treated material for framing and main sheathing.

G. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than seven (7) days during normal weather or three (3) days when the temperature is expected to rise above 80°F (27°C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material lawfully.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. 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.

B. Security Storage Enclosure: 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.

C. 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.

2. At Substantial Completion, clean and renovate permanent facilities used during the construction period.

a. Replace significantly worn parts and parts subject to unusual operating conditions.

END OF SECTION 015000

SECTION 015723
STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

1. GENERAL

1.1 The Contractor shall exercise caution to guard against the degradation of the waters of the state due to construction-related pollutants (silt, debris, and petroleum products). Construction shall be performed in accordance with the Missouri State Operating Permit – General Permit Number MO-RA25810 and the SWPPP included on APPENDIX "A".

SECTION 017400
CLEANING AND WASTE MANAGEMENT

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 and waste management 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 twice each month, and more often if necessary, completely remove all scrap, debris, and waste material from the jobsite.
4. Provide adequate storage for all items awaiting removal from the jobsite, observing all requirements for fire protection and protection of the ecology.

B. Site

1. Daily, inspect the site and pick up all scrap, debris, and waste material. Remove all such items to the place designated for their storage.
2. Weekly, inspect all arrangements of materials stored onsite. Re-stack, tidy, or otherwise service all material arrangements.
3. Maintain the site in a neat and orderly condition at all times.

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. 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 hard surface 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 building.
6. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances.
7. Remove debris and surface dust from limited access spaces, including equipment vaults, manholes, and similar spaces.
8. Broom clean concrete floors in unoccupied spaces.
9. Remove labels that are not permanent labels.
10. 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.

11. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint droppings, and other foreign substances.

12. Clean plumbing fixtures to a sanitary condition free of stains, including stains resulting from water exposure.

13. Clean HVAC equipment to remove all debris and surface dust.

14. Clean light fixtures and reflectors to function with full efficiency.

15. Leave the Project clean and ready for occupancy.

B. Removal of Protection: Remove temporary protection and facilities installed during construction to protect previously completed installations during the remainder of the construction period.

C. Compliances: Comply with governing regulations and safety standards for cleaning operations. Remove waste materials from the site and dispose of lawfully.

1. Where extra materials of value remain after Final Acceptance by the Owner, they become the Owner’s property.

END OF SECTION 017400

SECTION 024119
SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Demolition and removal of selected portions of existing wastewater treatment equipment and lagoons.

B. Related Work:

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

C. References:

1. American National Standard Institute (ANSI):

a. ANSI A10.6 - Safety and Health Program Requirements for Demolition Operations.

2. National Fire Protection Association (NFPA):

a. NFPA 241 - Standard for Safeguarding Construction, Alteration, Demolition Operations.

1.2 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 MATERIAL OWNERSHIP

A. Unless otherwise indicated or directed, demolition waste becomes property of Contractor.

1.4 INFORMATIONAL SUBMITTALS

A. Submit under provisions of Section 013300.

B. Schedule of Selective Demolition activities. Indicate the following:

1. Detailed sequence of selective demolition and removal work with starting and ending dates for each activity. Ensure Owner’s on-site operations are uninterrupted.

2. Coordination for shut-off, capping, and continuation of process piping and equipment.

3. Coordination of Owner's continuing occupancy of portions of existing process structures, building, and of Owner's partial occupancy of completed Work.

C. Pre-demolition Photographs or Video: Submit before Work begins.

1.5 PROJECT CONDITIONS

A. Existing Conditions: Accept the Project site in the condition which it exists at the time of the award of the contract.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Owner will maintain operation of portions of process structures adjacent to selective demolition areas. Conduct selective demolition so Owner's operations will not be disrupted.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Owner.

E. Contractor shall verify all demolition dimensions shown prior to commencing demolition.

1.6 BASIS OF PAYMENT

A. Measurement: No measurements will be made for demolition work. Payment will be made on a lump sum basis.

B. Items included: As indicated and required to complete the work.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Comply with ANSI A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

B. Notify Engineer of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

C. Verify that utilities have been disconnected and capped before starting selective demolition.

3.2 PREPARATION

A. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent structures and facilities to remain.

1. Provide protection to insure safe passage of people around selective demolition areas.

2. Comply with requirements for temporary controls specified in Section 015000.

B. Provide and maintain temporary shoring, bracing, and structural supports as required to preserve stability and prevent movement or collapse of construction to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

3.3 MECHANICAL/ELECTRICAL SYSTEMS AND EQUIPMENT

A. Existing Systems to Remain: Maintain systems indicated to remain and protect them against damage.

B. Existing Systems to be Removed or Abandoned: Locate, identify, disconnect, and seal or cap off indicated mechanical/electrical systems serving items to be selectively demolished.

1. Owner will arrange to shut-off indicated systems when requested by Contractor.
2. If systems are required to be removed or abandoned, provide temporary systems that bypass area of selective demolition and that maintain continuity of system operation.
3. Piping to be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
4. Equipment to be Removed: Disconnect and cap services and remove equipment.
5. Equipment to be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment. When appropriate, reinstall, reconnect, and make equipment operational.

3.4 SELECTIVE DEMOLITION, GENERAL

A. Conduct selective demolition and debris removal operations to ensure minimum interference with adjacent facilities.

B. Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
2. Where existing equipment, piping, appurtenances, supports, brackets, clamps, etc. are removed, grind all anchor bolts and fasteners to 1½-inches below surface and patch with non-shrink grout.
3. Dispose of demolished items and materials promptly.

C. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Protect items from damage during transport and storage.
3. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make them functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Owner or Owner's Representative, items may be removed to a suitable, protected storage area during selective demolition then cleaned and reinstalled after selective demolition operations are complete.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning of demolished materials is prohibited.

3.6 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolitions operations began.

END OF SECTION 024119

SECTION 031000
CONCRETE FORMWORK

PART 1 - GENERAL

1.1 SUMMARY

A. This Section covers formwork for cast-in-place concrete including:

1. Form materials.
2. Form accessories.
3. Form construction and removal.

B. Related Work:

1. Section 032000 - Concrete Reinforcement
2. Section 033000 - Cast-in-Place Concrete

C. References:

1. American Concrete Institute (ACI):

a. ACI 318 - Building Code Requirements for Reinforced Concrete.
b. ACI 347 - Recommended Practice for Concrete Form Work.

2. ASTM International (Formerly American Society for Testing and Materials):

a. ASTM C31 - Making and Curing Concrete Test Specimens in the Field.

1.2 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Include manufacturer’s product data for form accessories.

1.3 BASIS OF PAYMENT

A. All Work under this Section shall be considered incidental to other related Work and no measurement or direct payment will be made.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

A. Forms for concrete exposed to view after construction:

1. Smooth finish exterior grade plywood, metal, metal-framed plywood faced or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces.
2. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings.

3. Provide form material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection.

B. Forms for concrete not exposed to view after construction:

1. Exterior grade plywood, lumber, metal or other acceptable material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Form Coatings:

1. Provide commercial formulation form-coating compounds that will not bond with, stain, nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.

D. Clean forms of sawdust, dust, dirt, and other foreign materials.

2.2 FORM ACCESSORIES

A. Form Ties:

1. Break-back, coil, or screw-type, except where otherwise specified.
2. Water-seal coil type or break-back water-seal type in walls below grade and walls of water-containing structures.
3. All types shall leave conical depression in concrete.
4. Space as required against pressure of newly-placed concrete.

B. Chamfer Strips:

1. 3/4 x 3/4 inch size except where otherwise indicated, maximum possible lengths.
2. Place in all forms to provide chamfer where concrete will have exposed projecting corners.

PART 3 - EXECUTION

3.1 FORM CONSTRUCTION:

A. Design, erect, support, brace and maintain formwork to conform to ACI 318 and ACI 347.

B. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation and position.

C. Adequately brace, stiffen and support forms to prevent perceptible deflection or settlement, and to hold plumb, level and true to line.

D. Construct sufficiently tight to prevent mortar leakage.

E. Space studs and stringers as required to support form facing against pressure of newly placed concrete. Use walls, strongbacks, shores and bracing as required.

F. Provide for offsets, sinkages, keyways, recesses, chamfers, blocking, screeds, bulkheads and other features required in the Work.

G. Coordinate with Work of other Sections in forming and placing openings, slots, sleeves, bolts,

anchors and inserts, and components of other Work. Accurately place and support items built into forms.

H. Design, fabricate and construct formwork for easy removal without marring concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, recesses and the like, to prevent swelling and for easy removal.

I. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Locate temporary openings on forms at inconspicuous locations.

J. Chamfer all exposed corners and edges of concrete structures using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

K. Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed. Retighten forms and bracing after concrete placement as required to eliminate mortar leaks and maintain proper alignment.

3.2 PREPARATION OF FORM SURFACES

A. Coat contact surfaces of forms with a form-coating compound before reinforcement is placed.

1. Thin form-coating compounds only with thinning agent of type, and in amount, and under conditions of form-coating compound manufacturer’s directions.
2. Do not allow excess form-coating material to accumulate in forms or to come into contact with concrete surfaces against which fresh concrete will be placed.
3. Apply in compliance with manufacturer’s instructions.

B. Coat steel forms with a non-staining, rust preventive form-oil or otherwise protect against rusting. Rust-stained steel formwork is not acceptable.

3.3 FORM REMOVAL

A. Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of work, may be removed after cumulatively curing at not less than 50 degrees F (10 degrees C) for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided curing and protection operations are maintained.

B. Formwork supporting weight of concrete, such as beam soffits, joints, slabs and other structural elements, may not be removed in less than 14 days and until concrete has attained at least 85% of design compressive strength at 28 days.

1. Determine potential compressive strength of in-place concrete by testing field-cured specimens representative of concrete location or member.
2. Test specimens shall be made, field-cured and tested as specified in ASTM C31.
3. All costs in connection with strength tests shall be Contractor’s responsibility.

C. Remove forms in a manner to avoid damage to the structure, with particular care for corners and edges.

3.4 RE-USE OF FORMS

A. Clean and repair surfaces of forms to be re-used in the Work.

B. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable for concrete surfaces exposed to view after construction.

C. Apply new form coating compound as specified in Part 3.2.

END OF SECTION 031000

SECTION 032000
CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section covers reinforcement for cast-in-place concrete including:

1. Steel reinforcing bars.
2. Welded wire fabric.
3. Bolsters, chairs and accessories.

B. Related Work:

1. Section 031000 - Concrete Formwork
2. Section 033110 – Normalweight Structural Concrete

C. References:

1. American Concrete Institute (ACI):

a. ACI 301 - Specifications for Structural Concrete for Buildings.
b. ACI SP-66 - Detailing Manual.
c. ACI 318 - Building Code Requirements for Reinforced Concrete.

2. ASTM International (Formerly American Society for Testing and Materials):

a. ASTM A82 - Steel Wire, Plain, for Concrete Reinforcement.
b. ASTM A185 - Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement.
c. ASTM A615 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

3. Concrete Reinforcing Steel Institute (CRSI):

a. Manual of Standard Practice.

1.2 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Furnish certification that products conform to the applicable requirements of the specified standards.

C. Submit drawings for fabrication, bending and placement of concrete reinforcement. Comply with ACI SP-66 showing bar schedules, stirrup spacing, diagrams of bent bars, arrangement of concrete reinforcement. Include special reinforcement required at openings through concrete structures.

1.3 DELIVERY, STORAGE AND HANDLING

A. Store steel reinforcement blocked-up off the ground and in orderly stacks.

B. Store only bars with the same identifying label in the same stack.

1.4 BASIS OF PAYMENT

A. All Work under this Section shall be considered incidental to other related Work and no measurement or direct payment will be made.

PART 2 - PRODUCTS

2.1 REINFORCEMENT BARS, TIES AND STIRRUPS

A. Materials:

1. Conform to ASTM A615, Grade 60, deformed.

B. Fabrication:

1. Fabricate with cold bends conforming to the recommended dimensions shown in ACI 318.
2. Fabricate bars according to the tolerances given in ACI 301, Chapter 5.
3. Field fabrication will be allowed only if Contractor has equipment to properly fabricate steel.
4. Attach metal or plastic tags with identifying mark or length corresponding with mark or length on drawing. Straight bars shall have mark number or size and length. Bent bars shall have mark number.
5. Contractor may, at his option, continue steel reinforcing through openings in walls and slabs, then field-cut the openings to achieve the required concrete cover between ends of bars and edge of opening.

2.2 WELDED WIRE FABRIC

A. Conform to ASTM A185 using bright basic wire conforming to ASTM A82.

B. Wire sizes W1.4 and smaller shall be galvanized.

2.3 SUPPORTS FOR REINFORCEMENT

A. Conform to ACI SP-66 and the CRSI Manual of Standard Practice.

B. Provide all bolsters, chairs, spacers and other devices necessary to properly space, support and fasten reinforcing bars and welded wire fabric in place.

C. Use wire bar type supports complying with CRSI recommendations, unless otherwise permitted. Do not use rocks, broken bricks, wood blocks, or concrete fragments for support of reinforcement.

1. For slabs on grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
2. For exposed to view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).

PART 3 - EXECUTION

3.1 PLACEMENT OF STEEL REINFORCEMENT

A. Place in accordance with Chapter 5 of ACI 301, Chapter 7 and 12 of ACI 318, and the CRSI Manual of Standard Practice.

B. Clean reinforcement of loose rust and mill scale, dirt, ice, and other materials which reduce or destroy bond with concrete.

C. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers as required.

D. Place reinforcement to obtain at least minimum coverages for concrete coverage. Minimum coverage shall conform to Chapter 5 of ACI 301 and Chapter 7 of ACI 318, unless otherwise indicated. Reinforcement bars shall be placed on center each way.

E. Arrange, space, securely and completely tie bars and bar supports with 16-gauge or larger annealed iron wire. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

F. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

END OF SECTION 032000

SECTION 033051
COLD WEATHER CONCRETE PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Description: This section consists of procedures to be followed when mixing, placing, and curing concrete in cold weather. Comply with ACI 306.1 and the following.

B. Definition: Procedures called out in this section shall be followed when the ambient temperature falls below 40°F. No concrete shall be placed when the temperature falls below 22°F.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 CONCRETE PLACEMENT

A. Concrete Temperature: When the ambient temperature falls below 40°F, the minimum temperature of concrete as placed shall be 50°F.

B. Preparation Before Placement: The inside of forms, reinforcing steel, and embedded fixtures shall be free of all snow and ice at the time concrete is placed. Concrete shall not be placed on a frozen subgrade. If the subgrade is frozen, concreting shall be delayed until the ground thaws sufficiently to insure that it will not freeze again during the curing period.

3.2 CONCRETE MIXING

A. As-Mixed Temperature: To maintain the temperature of the concrete above the minimum placing temperature required in Paragraph 2.1, the as-mixed temperature shall not be less than 55°F when the ambient temperature falls below 40°F.

B. If the water or aggregate has been heated, the water shall be combined with the aggregate in the mixer before cement is added. Cement shall not be added to mixtures of water and aggregate when the temperature of the mixture is greater than 100°F.

3.3 CURING AND PROTECTION

A. Concrete Protection: When the ambient temperature of the air falls below 40°F, the concrete shall be protected during the required curing period by one of the methods outlined below. The Contractor shall make arrangements for protecting the concrete, and shall gain approval of the method from the Engineer prior to placement of the concrete.

1. Insulating Blanket: The concrete may be protected by the use of commercial insulating blanket or bat insulation. The effectiveness of insulation shall be monitored by the Resident Project Representative by placing a thermometer under the insulation in contact with the concrete. If the temperature of the concrete is below 50°F, additional insulating material shall be applied. Extra care shall be taken to prevent corners and edges of the concrete from freezing.

2. Dry Straw: Concrete may be protected by using dry straw, 12 in. to 24 in. thick. Tarpaulins, canvas or waterproof paper shall be used to protect the straw. The temperature of the concrete shall be checked as specified in paragraph 4.1.1 of this Section and additional straw shall be applied if necessary.

3. Heated Enclosures: The concrete may be protected by an enclosure constructed of wood framework covered with tarpaulins or plastic sheets. The enclosure shall be sturdy and reasonably airtight, with ample space provided between concrete and enclosure to permit free circulation of warm air. The enclosure shall be heated by live steam, steam in pipes, oil-fired blowers or salamanders. If a fuel-burning heater is utilized, care shall be taken to prevent drying of the concrete and to prevent injury due to concentration of heat or carbon dioxide. Arrangements for heating the enclosure shall be made and approved by the Engineer prior to placement of the concrete. Air temperature within the enclosure shall be no lower than 50°F and no higher than 70°F

B. Required Curing Period: The curing shall continue for a cumulative number of seven days, not necessarily consecutive, during which the temperature of the air in contact with the concrete is 50°F or above. If high-early-strength cement has been used, the curing shall continue for a total of three days.

END OF SECTION 033051

SECTION 033052
HOT WEATHER CONCRETE PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Description: This section consists of procedures to be followed when mixing, placing, and curing concrete in hot weather. Comply with ACI 301 and as follows.

B. Definition: Procedures called out in this section shall be followed when the ambient temperature of the air rises above 90°F.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 CONCRETE PLACEMENT

A. Concrete Temperature: Concrete placed in hot weather shall have a placing temperature which will not cause difficulty from loss of slump, flash set, or cold joints (less than 90°F).

B. Preparation Before Placement: Forms, reinforcing steel, and subgrade shall be sprinkled with cool water just before concrete is placed. Prior to placing concrete, however, there shall be no standing water on the subgrade.

3.2 CONCRETE MIXING

A. Ingredients: The ingredients shall be cooled before mixing if necessary to maintain the temperature of the concrete below the maximum placing temperature required in paragraph 2.1.

3.3 CURING AND PROTECTION

A. Curing Procedures: During hot weather, arrangements for installation of windbreaks, shading, spraying, sprinkling, ponding, or wet covering shall be made and approved from the Owner gained in advance of placement and such protective measures shall be taken as quickly as concrete hardening and finishing operations will allow.

END OF SECTION 033052

SECTION 033100
CONCRETE ADMIXTURES

PART 1 - GENERAL

1.1 SUMMARY

A. Description: The work of this section consists of furnishing and using materials and procedures for air-entrainment of and/or addition of chemical admixtures to concrete.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Air-entrainment Admixtures: Air-entrainment shall be accomplished by the use of Type 1 Portland cement with the addition of an approved air-entrainment admixture or by the use of Type 1A Portland cement. Air-entrainment admixtures shall conform to "Standard Specifications for Air-Entraining Admixtures for Concrete", ASTM C260.

B. Water Reducing, Retarding, and Accelerating Admixtures: Water reducing, retarding, or accelerating admixtures, if permitted by the Engineer, shall conform to "Standard Specifications for Chemical Admixtures for Concrete", ASTM C494.

PART 3 - EXECUTION

3.1 EXECUTION

A. Water Reducing, Retarding, and Accelerating Admixtures: Such admixtures may be used when such use is requested by the Contractor subject to review and approval by the Engineer. For certain uses, the Engineer reserves the right to require the use of a retardant or other admixtures for specific uses such as a retardant in extensive wall pours to assure elimination of cold joints or for other such purposes. No additional compensation will be allowed when such admixtures are used either at the Contractor's request or at the request of the Engineer. However, when certain such admixtures are used, it will be allowable to reduce the cement content of the mix to a minimum of 5½ bags of cement per cubic yard of concrete, subject to the following conditions: A trial batch and test cylinders taken therefrom demonstrate that the mix will meet the strength, workability, slump, and durability requirements of the specified mix previously herein stated. The strength shall be determined from seven-day test cylinders from a trial batch utilizing the admixture and made using the aggregates selected for the job, to establish the correct proportions to give proper workability with the water-cement ratio specified. The combination of fine and coarse aggregates shall be adjusted within limits specified until the mix meets approval of the Engineer. The seven-day test strength shall equal 95 percent of the specified minimum 28-day strength.

B. Air-entraining and chemical admixtures shall be charged into the mixer as a solution and shall be dispensed by an automatic dispenser or similar metering device. Powdered admixtures shall be weighed or measured by volume as recommended by the manufacturer. The accuracy of measurement by any admixture shall be within ± three percent.

C. Two or more admixtures may be used in the same concrete, provided such admixtures are added separately during the batching sequence and provided further that the admixtures

used in that combination retain full efficiency and have no deleterious effect on the concrete or on the properties of each other.

D. Addition of retarding admixtures shall not be significantly delayed after the addition of the cement.

E. The addition of calcium chloride to the mix will not be allowed.

END OF SECTION 033100

SECTION 033110
NORMALWEIGHT STRUCTURAL CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Description: The work of this section shall include the furnishing, hauling, placing, curing, and testing of all portland cement concrete required by the construction drawings and herein specified.

B. Related Work:

1. Section 031000 - Concrete Formwork
2. Section 032000 - Concrete Reinforcement
3. Section 033100 – Concrete Admixtures

1.2 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Include manufacturer’s product data with application and installation instructions for proprietary materials and items including admixtures, patching compounds, waterstops, joint systems, curing compounds and others as requested.

C. Furnish certification that products conform to the applicable requirements of the specified standards.

D. Furnish laboratory test reports for concrete materials and mix design test as specified.

E. Furnish samples of materials as specified and as otherwise required, including names, sources and descriptions.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Portland Cement: Portland cement shall conform to "Standard Specifications for Portland Cement" ASTM C150 Type 1 or Type 1A. One sack of cement shall be considered as one cubic foot of volume or 94 pounds by weight.

B. Aggregates: Fine and coarse aggregates shall conform to "Standard Specification for Concrete Aggregate", ASTM C33. The nominal maximum size of the coarse aggregate shall not be larger than one-fifth of the narrowest dimension between sides of forms, one-third the depth of the slabs, nor three-fourths of the minimum clear distance between reinforcing bars or between bars and forms, whichever is least. Coarse aggregate gradation shall conform to ASTM C33, Size 57.

C. Admixtures:

1. Air-entrainment Admixtures: Shall be as specified in Section 033100 “Concrete Admixtures.”

2. Water Reducing, Retarding, and Accelerating Admixtures: If permitted by the Engineer according to procedures set forth in Section 033100 “Concrete Admixtures,” water reducing, retarding, and accelerating admixtures shall conform to requirements of ASTM C494, latest revision.

D. Mixing Water: Mixing water for concrete shall be fresh, clean, and potable. Non-potable water may be used only if it produces mortar cubes having 7- and 28-day strengths equal to the strength of similar specimens made with distilled water, when tested in accordance with "Method of Test for Compressive Strength of Hydraulic Cement Mortars", ASTM C109.

E. Curing Compounds: All curing compounds shall conform to specifications for liquid membrane forming compounds for curing concrete ASTM 309, applied in accordance with manufacturer's recommendations.

2.2 PROPORTIONING CONCRETE

A. General: Proportions of aggregate to cement and water shall be such as to provide a concrete mix that will work readily into corners and angles of forms and around reinforcement and other embedded items without causing segregation of materials.

B. Concrete Strengths:

1. Structural Concrete: Shall be provided to develop a compressive strength of not less than 4000 psi at 28 days for field-cured cylinders. All structural concrete shall contain entrained air from 3½ to 6½ percent by volume. Concrete shall have a maximum water-cement ratio of 0.45 by weight. Moisture in the aggregate shall be measured and the quantity included in the water-cement ratio specified. The minimum cement content of the mix shall be six sack per cubic yard of concrete.

2. Fill Concrete: Shall be provided to develop a compressive strength of not less than 2500 psi at 28 days for field-cured cylinders. All fill concrete shall contain entrained air from 3½ to 6½ percent by volume. Concrete shall have a maximum water-cement ratio of 0.55 by weight. Moisture in the aggregate shall be measured and the quantity included in the water-cement ratio specified.

C. Concrete Proportions: Portland cement concrete shall be proportioned and so placed as to provide an average compressive strength sufficiently high to minimize the number of compressive strength tests falling below the specified concrete strength. The proportions of the concrete shall produce a mixture that will work readily with the placement method used, into corners and angles of forms and around reinforcement. Segregation of materials in the concrete shall not be permitted nor collection of excess free water on the surface. Slump of concrete shall be the minimum that is practicable, and shall conform with the following:

1. 4" max., 2" min. - footings, heavy walls, piers, buttresses
2. 5" max., 3" min. - light walls, beams, columns, stairs
3. 3" max., 2" min. –concrete floors with monolithic finish

a. In no case shall the amount of fine aggregate be more than the amount of coarse aggregate (measured by weight) nor shall be the amount of coarse aggregate be such as to produce honeycombing.

D. Trial Batches: Proportions of concrete ingredients shall be established on the basis of laboratory trial batches, using the aggregates selected for the job, to provide conformance

with strength, workability, and consistency requirements at the water-cement ratio specified. When different materials are used on different portions of the project, each combination shall be evaluated separately. Test specimens shall be made in accordance with ASTM C192, latest revision, and shall be tested in accordance with ASTM C39, latest revision. The combination of fine and coarse aggregates shall be adjusted within limits specified in ASTM C33, latest revision, until the mix meets the approval of the engineer. The mix design and certified test results shall be provided to the Engineer prior to placement of the concrete on the job site.

PART 3 - EXECUTION

3.1 MIXING CONCRETE

A. Ready-Mixed Concrete: Ready-mixed concrete shall be used and shall conform to the "Standard Specification for Ready-Mixed Concrete" ASTM C94 and to the applicable portions of these Specifications.

B. Admixtures: Shall be as specified in Section 033100 “Concrete Admixtures.”

C. Retempering: Concrete shall be mixed only in quantities for immediate use. Concrete which has set shall not be retempered, but shall be discarded.

D. Indiscriminate addition of water to increase slump or workability shall be prohibited. When concrete arrives at the project with slump below that suitable for placing, water may be added only by authorized representatives of the concrete supplier, and then only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded. The water must be incorporated by additional mixing equal to at least half of the total mixing required. Any addition of water above that permitted by the limitation on water-cement ratio must be accompanied by a quantity of cement sufficient to maintain the proper water-cement ratio. Such addition must be approved by the Resident Project Representative.

E. Weather Conditions:

1. Cold Weather: Shall be as specified in Section 033051 - Cold Weather Concreting Procedures.

2. Hot Weather: Shall be as specified in Section 033052 - Hot Weather Concreting Procedures.

3.2 CONCRETE PLACEMENT

A. Preparation Before Placing: Hardened concrete and foreign materials shall be removed from the inner surfaces of the conveying equipment.

B. Formwork shall be completed; reinforcement shall be secured in place; expansion joint material, waterstops, anchors, pipe sleeves, and other embedded items shall be positioned; and the entire preparation shall be approved by the Resident Project Representative before any concrete is placed. Subgrades shall be sprinkled sufficiently to eliminate absorption of water from the concrete before any concrete is placed.

C. Before placing concrete slabs on grade, where required, a polyethylene vapor barrier of 4 mil. thickness, or approved equal, shall be installed in accordance with the manufacturer's recommendations. A layer of sand shall be placed on the granular fill to protect the vapor barrier during placement of concrete.

D. Conveying: Concrete shall be handled from the mixer to the place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients and in a manner which will assure that the required quality of the concrete is obtained. Conveying equipment shall be of size and design to ensure a continuous flow of concrete at the delivery end and shall be approved by the Engineer. Conveying equipment and operations shall conform to the following requirements.

1. Unless noted otherwise, truck mixers, agitators, and non-agitating units and their manner of operation shall conform to the applicable requirements of "Specifications for Ready-Mixed Concrete", ASTM C94. All conveying equipment shall be adequately sized to ensure that discharge of the concrete from each truck to the point of its final placement shall be accomplished within 45 minutes after the truck arrives at the site. Any truckload of concrete not discharged within the 45 minute time limit may be rejected by the Resident Project Representative and shall not be placed on the project.

2. Belt conveyors shall be horizontal or at a slope which will not cause segregation or loss. An approved arrangement shall be used at the discharge end to prevent separation. Long runs shall be discharged without separation into a hopper.

3. Chutes shall be metal or metal-lined and shall have a slope not exceeding 1 vertical to 2 horizontal and not less than 1 vertical to 3 horizontal. Chutes more than 20 feet long and chutes not meeting the slope requirements may be used provided they discharge into a hopper before distribution.

4. Pumping or pneumatic conveying equipment shall be without "Y" sections, and with adequate pumping capacity. The equipment shall be cleaned at the end of each operation. Pneumatic placement shall be controlled so that separation is not apparent in the discharged concrete. The maximum loss of slump in pumping or pneumatic conveying equipment shall be 1½ inches.

E. Depositing: Concrete shall be deposited continuously, or in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness within the section. If a section cannot be placed continuously, construction joints and waterstops shall be located at points as provided for in the drawings or as approved by the Engineer. Placing shall be carried on at such a rate that the concrete which is being integrated with fresh concrete is still plastic. Concrete which has partially hardened or has been contaminated by foreign materials shall not be deposited. Temporary spreaders in forms shall be removed when the concrete placing has reached an elevation rendering their service unnecessary. They may remain embedded in the concrete only if made of metal or concrete and if prior approval has been obtained.

1. Concrete shall be deposited as nearly as practicable to its final position to avoid segregation due to flowing or rehandling and shall drop vertically into the center of the forms. In no case shall concrete be allowed to fall more than five feet or at other times when required by the Resident Project Representative, drop chutes or other approved devices shall be used.

F. Where surface mortar is to be the basis of the finish, the coarse aggregate shall be worked back from the forms with a suitable tool so as to bring a full surface of mortar against the form, without the formation of excessive surface voids. All concrete shall be consolidated by vibration, spading, rodding, or forking, so that the concrete is thoroughly worked around the reinforcement, around embedded items, and into corners of forms, eliminating all air or stone pockets, which may cause honeycombing, pitting, or planes of weakness. Mechanical vibrators shall have a minimum frequency of 7,000 revolutions per minute and shall be operated by competent workmen. Over vibrating and use of vibrators to transport concrete within forms shall not be allowed. Vibrators shall be inserted and withdrawn at

many points, from 18 to 30 inches apart. At each insertion, the duration shall be sufficient to consolidate the concrete, but not sufficient to cause segregation, generally from 5 to 15 seconds duration. A spare vibrator shall be kept on the job site during all concrete placing operations.

G. Weather Conditions:

1. Unless adequate protection is provided and approved by the Resident Project Representative, concrete shall not be placed in rain, sleet, or snow. Rainwater shall not be allowed to increase the mixing water nor to damage the surface finish.

2. Cold Weather: Shall be as specified in Section 033051 - Cold Weather Concreting Procedures.

3. Hot Weather: Shall be as specified in Section 033052 - Hot Weather Concreting Procedures.

H. Concreting Under Water: No concrete shall be placed under water without the written approval of the Engineer.

3.3 PATCHING

A. General: All tie holes and all repairable defective areas shall be patched immediately after form removal. After being cleaned and thoroughly dampened, the holes shall be filled with patching mortar and finished.

B. Defective Areas: All honeycombed and other defective concrete shall be removed down to sound concrete. The area to be patched and an area at least six inches wide surrounding it shall be dampened to prevent absorption of water from the patching mortar. A bonding grout shall be prepared using a mix of approximately one part cement to one part fine sand passing a No. 30 mesh sieve, shall be mixed to the consistency of thick cream, and shall then be well brushed into the surface.

C. The patching mixture shall be made of the same material and of approximately the same proportions as used for the concrete, except that the coarse aggregate shall be omitted and the mortar shall consist of not more than 1 part cement to 1½ parts sand by damp loose volume. White portland cement shall be substituted for a part of the gray portland cement on exposed concrete in order to produce a color matching the color of the surrounding concrete, as determined by a trial patch.

D. The quantity of mixing water shall be no more than necessary for handling and placing. The patching mortar shall be mixed in advance and allowed to stand with frequent manipulation with a trowel, without addition of water, until it has reached the stiffest consistency that will permit placing.

E. After surface water has evaporated from the area to be patched, the bond coat shall be well brushed into the surface. When the bond coat begins to lose the water sheen, the premixed patching mortar shall be applied. The mortar shall be thoroughly consolidated into place and struck off so as to leave the patch slightly higher than the surrounding surface. To permit initial shrinkage, it shall be left undisturbed for at least one hour before being finally finished. The patched area shall be kept damp for seven days. Metal tools shall not be used in finishing a patch in a formed wall which will be exposed.

F. Proprietary Materials: If desired by the Contractor, proprietary compounds for adhesion or as patching ingredients may be used in lieu of or in addition to the foregoing patching

procedures. Such compounds shall be used in accordance with the manufacturer's recommendations and shall be Standard Dry Wall Products or approved equal.

3.4 CURING AND PROTECTION

A. General: Exposed surfaces of concrete shall be protected from premature drying and excessively hot or cold temperatures for the period of time necessary for the hydration of the cement and proper hardening of the concrete.

B. Curing: Initial curing shall immediately follow the finishing operation. Concrete shall be kept continuously moist for at least 24 hours by either ponding or continuously sprinkling, absorptive mat, or fabric kept continuously wet, or sand or other covering kept continuously wet. Whichever material or method is chosen shall be approved by the Resident Project Representative.

C. Immediately following the initial curing and before the concrete has dried, final curing shall be accomplished by either continuation of the method used for initial curing, waterproof paper conforming to "Specifications for Waterproof Paper for Curing Concrete", ASTM C171, or other moisture retaining coverings as approved by the Engineer.

D. The final curing shall continue for a cumulative number of seven days, not necessarily consecutive, during which the temperature of air in contact with the concrete is above 50°F. If high-early-strength cement has been used, the final curing shall continue for a total of three days. Changes in the temperature of the concrete shall be as uniform as possible and shall not exceed 5°F in any one hour, nor 50°F in any 24-hour period.

E. Cold Weather: Shall be as specified in Section 033051 - Cold Weather Concreting Procedures.

F. Hot Weather: Shall be as specified in Section 033052 - Hot Weather Concreting Procedures.

G. Protection from Mechanical Injury: During curing, the concrete shall be protected from damaging mechanical disturbances, heavy shock, or excessive vibration. All finished surfaces shall be protected from damage caused by construction equipment, materials, or methods and rain or running water.

H. Temperature and Shrinkage Cracks: Any temperature and shrinkage cracks which develop prior to the final acceptance of the project by the Owner shall be repaired and waterproofed to the satisfaction of the Engineer and as called for in other applicable parts of the specifications.

3.5 TESTING

A. General: Contractor shall provide access to the Engineer and his representatives for any and all inspection of concrete placement. The Contractor shall pay and arrange for all testing of concrete by a third party as required by these specifications.

B. All strength tests shall be performed by a reputable testing laboratory hired by the Contractor.

C. Slump Tests: Slump tests shall be conducted at not less than the frequency of compressive strength samples and shall conform to "Standard Method of Test for Slump of Portland

Cement Concrete", ASTM C143. The Contractor shall provide all necessary equipment, materials, sampling, and testing.

D. Strength Tests: Test cylinders shall be taken by the Contractor and shall be cured and tested in accordance with the "Standard Method of Making and Curing Concrete Compressive and Flexural Strength Test Specimens in the Field", ASTM C31. Not less than three specimens shall be made for each 50 cubic yards of concrete or fraction thereof in each day's pour, except that in no case shall a given mix design be represented by less than five tests. In the event that three test cylinders are not considered sufficient to represent the work done, the Resident Project Representative may direct that extra cylinders be made. The standard age of test shall be 28 days, but seven-day tests and 14-day tests may be used provided the relation between the seven-day, 14-day, and 28-day strengths of the concrete is established in advance by test for the materials and proportions used and approved by the Engineer. If the Contractor desires, extra cylinders may be made and tested at his expense for the purpose of indicating sufficient concrete strength for form removal or other purposes. If the average of the strengths of the test cylinders fails to attain the specified strength so as to justify doubt as to the quality of the concrete, further tests shall be made, at the Contractor's expense, of the concrete in place to determine its fitness to remain in the structure. These tests shall be performed in accordance with the "Standard Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete", ASTM C42.

1. The strength level of the concrete will be considered acceptable if the average of three 28-day test strength results equal or exceed the specified compressive strength, and no individual tests fall below the specified compressive strength by more than 500 psi.

E. Air Content Tests: Air content tests shall be conducted at not less than the frequency of compressive strength samples and shall conform to the "Standard Method of Test for Air Content of Fresh Mixed Concrete by the Volumetric Method", ASTM C173, or the "Standard Method of Test for Air Content of Freshly Mixed Concrete by the Pressure Method", ASTM C231. The Contractor shall provide all necessary equipment, materials, sampling, and testing.

3.6 GROUT

A. General: This item includes furnishing, placing, and finishing the grout as required by the drawings or specified herein.

B. Materials: Material requirements for grout shall be as set forth in Part 2 of this specification.

C. Proportioning and Mixing: Grout shall consist of a mixture of one part portland cement and two parts fine aggregate with a slump of three inches to five inches. The water-cement ratio shall be maintained at not more than 4½ gallons per bag of cement. The ingredients shall be mixed in accordance with the applicable portions of Paragraph 4 of this specification, so as to produce a uniform mass of material.

D. Placing: Before placing grout, the concrete shall be thoroughly cleaned of all dust, dirt, or other deleterious material and then shall be thoroughly wetted. Grout shall be placed in one continuous operation to the thickness shown on the plans with no construction joints allowed.

E. After the grout is placed, it shall be given a floated finish and shall be cured.

F. Non-Shrink, Non-Metallic Grout: Where called for on the drawings or by these specifications, or where, for a specific application, its use is otherwise required, non-shrink, non-metallic grout shall be utilized. Manufacturer's instructions for application shall be strictly followed.

END OF SECTION 033110

SECTION 083113.13
VAULT ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes materials and installation requirements for factory fabricated floor access doors and frames.

B. Related Work:

1. Section 330516 - Utility Structures

1.2 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Product Data: Provide manufacturer's product data and specifications verifying compliance with specified requirements.

C. Shop Drawings: Show profiles, accessories, location, and dimensions.

1.3 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to site in manufacturer's original packaging with labels clearly indicating manufacturer and material.

B. Store materials in a dry, protected, well-vented area, protected from damage and in accordance with manufacturer's instructions.

C. Protect materials and finishes during handling and installation to prevent damage.

1.4 BASIS OF PAYMENT

A. Measurement: Complete product in place per lump sum

B. Items included: As indicated and required for a complete installation.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with requirements, provide vault access doors as manufactured by one of the following:

1. Bilco Corporation.
2. Halliday Products.
3. U.S. Foundry and Manufacturing Corporation.
4. Approved equal.

2.2 ACCESS DOORS

A. Provide access doors of type and size indicated or required for the specific application. Vault access doors provided for submersible pump installations shall be coordinated with and approved by the pump supplier to ensure access opening is of adequate size to allow for ease of pump installation and removal.

B. Design and Construction Materials:

1. Frame shall be one-piece extruded aluminum incorporating a continuous concrete anchor.

2. Door leaves shall be 1/4” aluminum diamond pattern plate, reinforced to support a minimum live load of 300 psf.

3. Doors shall open to 90 degrees and automatically lock with an aluminum or stainless steel hold open arm with release handle. Doors shall close flush with frame.

4. Equip doors with cylinder assist, a non-corrosive flush drop handle for lifting, and a non-corrosive staple for padlocking.

5. Hinges and all fastening hardware shall be stainless steel.

6. Finishes: Factory finish shall be mill finish aluminum. An alkali resistant bitumastic coating shall be applied to the frame exterior where it will come in contact with concrete.

2.3 FALL-THROUGH PREVENTION SYSTEM:

A. Provide access openings with a hinged safety grate system.

B. Design and Construction Materials:

1. Grate shall be aluminum construction, designed to support a minimum live load of 300 psf. Grate openings shall be 4" x 6" to allow for visual inspection and limited accessibility for maintenance purposes when the grate is closed.

2. Grate shall operate independent of door leaf reinforcing so that door will continue to meet specified load requirements even if the grate is damaged or removed.

3. Grate shall pivot on an aluminum hinge with stainless steel hardware that permits the grate to rotate upward 90 degrees and automatically lock in place.

4. Equip grate with a pull rod to raise the grate, and a separate rod that will automatically engage to secure the grate in the open position and can be lifted upward to permit the grate to close.

5. All hardware shall be aluminum or stainless steel.

6. Grate shall have an OSHA safety yellow finish to increase visual awareness of the safety hazard.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Verify manufacturer’s access door and frame details for accuracy to fit the application prior to installation.

B. Install access doors as indicated on the drawings and in accordance with the manufacturer’s installation instructions.

C. Install fall-through prevention system in accordance with the manufacturer’s installation

instructions.

END OF SECTION 083113.13

SECTION 099100
PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. The work in this section consists of furnishing, hauling, storing, application, and cleanup of all parts and associated materials necessary to complete the painting schedule as detailed herein, and all equipment, tools, labor, and incidentals necessary to complete this item.

B. The Contractor shall familiarize himself with the specifications for other trades on this project and with the provisions in them relating to or affecting painting. This work shall be scheduled and coordinated with other trades and shall not proceed until other work and/or conditions are as required to achieve satisfactory work.

C. The Owner or his representative reserves the right to change, increase, or reduce the work as may be necessary and, in such event, shall notify the Contractor in writing. If no unit prices are set forth in the contract or subcontract, the basis of payment or credit for such changes shall be negotiated and agreed upon. The Contractor shall make no changes and do no extra work without written authorization from the Owner.

D. Exclusions: Contractor shall not be required to apply prime coats on items delivered with prime or shop coats already applied. Painting will not be required on items completely factory finished. Contractor shall insure compatibility of any factory applied prime coat and field applied finish coat and shall touch up any damaged areas of materials delivered to the job with prime coats already applied.

1. Unpainted and otherwise uncoated exterior above grade concrete walls, whether cast-in-place, masonry, or precast, shall be effectively sealed with an alkalkoxysilane solution as specified in Section 099300 - TRANSPARENT FINISHES.

2. Unpainted and otherwise uncoated exterior concrete slabs shall be effectively sealed with an acrylic polymer and copolymer solution, as specified in Section 099300 - TRANSPARENT FINISHES.

E. Related Work:

1. Section 099300 – Transparent Finishes

2. Section 330518 – Pressure Pipe and Fittings

F. References:

1. Steel Structures Painting Council (SSPC):

a. SSPC SP1 - Solvent Cleaning: Removes oil, grease, soil, drawing and cutting compounds, and other soluble contaminants.

b. SSPC SP2 - Hand Tool Cleaning: Removes all loose scale, rust, paint and other loose detrimental foreign matter, but not adherent material.

c. SSPC SP3 - Power Tool Cleaning: Removes all loose scale, rust, paint and other loose detrimental foreign matter, but not adherent material. Provides slightly higher degree of cleanliness than Hand Tool Cleaning.

d. SSPC SP5 - White Metal Blast Cleaning: Removes all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products and other foreign matter.

e. SSPC SP6 - Commercial Blast Cleaning: Removes all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products and other foreign matter. Two-thirds of each square inch free of all visible residues; remainder only slight discoloration.

f. SSPC SP10 - Near-White Metal Blast Cleaning: Removes all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products and other foreign matter. Ninety-five percent of each square inch free of all visible residues; remainder only slight discoloration.

g. SSPC SP11 - Power Tool Cleaning To Bare Metal: Removes all loose scale, rust, paint and other loose detrimental foreign matter. Slight residues of rust and paint may be left in the lower portion of pits if the original surface is pitted. Differs from SSPC SP3 in that it requires more thorough cleaning and a surface profile not less than 1 mil.

h. SSPC SP12 - Surface Preparation By Water Jetting: Surface preparation and cleaning of steel and other hard materials by high- and ultra-high pressure water jetting to achieve various degrees of cleanliness prior to recoating. This standard is limited in scope to the use of water only without the addition of solid particles in the stream.

1.2 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Furnish manufacturer’s technical information, including paint label analysis and application instructions for each material proposed for use. Include Material Safety Data Sheets.

C. Furnish color charts for selection and acceptance

D. Furnish certification by paint manufacturer(s) that proposed products are suitable for the specific substrates and service intended.

1.3 QUALITY ASSURANCE

A. Single Source Responsibility: Provide primers and other undercoat paint produced by the same manufacturer as finish coats. Use only thinners approved by paint manufacturer, and use only within recommended limits.

B. Coordination of Work: Review other sections of these specifications in which prime coats are to be provided to ensure compatibility of total coatings system for various substrates. Upon request from other trades, furnish information or characteristics of finish materials provided for use, to ensure compatible prime coats are used.

C. Furnish paints that have been recommended by the manufacturer for the substrate and service conditions specified.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to job site in original, new and unopened packages and containers bearing manufacturer’s name and label, and following information:

1. Manufacturer’s name, product name and number.

2. Type of paint and generic name.

3. Color name and number.

4. Storage and temperature limits.

5. Thinning, mixing and application instructions.

6. Drying, recoat or curing time.

B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage of paint in a clean condition, free of foreign materials and residue.

1. Protect from freezing where necessary.

2. Take all precautions to ensure that workmen and work areas are adequately protected from fire hazards and health hazards resulting from handling, mixing and application of paints.

3. Dispose of used or leftover containers, thinners, rags, brushes, and rollers in accordance with applicable regulations.

1.5 BASIS OF PAYMENT

A. Measurement: Complete product in place per lump sum.

B. Items included: As indicated and required for a complete installation.

PART 2 - PRODUCTS

2.1 COATING SYSTEMS

A. Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following:

1. Tnemec Company, Inc.

2. The Sherwin-Williams Company.

3. Carboline

4. Approved equal.

B. Paint Schedule: Paint shall be applied to all newly constructed facilities except as noted in Section 099300 - TRANSPARENT FINISHES.

1. Concrete (new) - Exterior Below Grade: Exterior surfaces of valve pits in contact with earth, (exterior, below-grade portion of wet well shall not be coated);

Dry Film Mils

Coal Tar Base

Surface Preparation: Clean and Dry	
1st Coat: 46-465 H.B. Tnemecol	7.0 - 9.0
2nd Coat: 46-465 H.B. Tnemecol	5.0 - 6.0
Total	12.0 -15.0

2. Concrete (new) - Interior Immersion: Items immersed or submerged in sewage including the interior surface of wet wells.

	Dry Film Mils
System 46-31 Coal Tar Epoxy	
Surface Preparation: Clean and Dry	
1st Coat: 46H-413 Hi-Build Tneme-Tar	14.0-20.0
Total	14.0-20.0

3. Steel and Ductile Iron - Immersion: Immersed or submerged, in sludge, or wastewater:

	Dry Film Mils
System 46-30 Coal Tar Epoxy	
Surface Preparation: SPC-SP10	
1st Coat: 46H-413 Hi-Build Tneme-Tar	14.0-20.0
Total	14.0-20.0

4. Steel and Ductile Iron Pipe Valves and Fittings – Interior and Exterior – Non-Immersion:

	Dry Film Mils
Aliphatic Polyurethane System	
Surface Preparation: SSPC-SP6	
1st Coat: N69 – Color Hi-Build Epoxoline II	4.0 – 6.0
2nd Coat: 1074 – Color Endura-Shield II	2.0 – 3.0
Total	6.0 – 9.0

2.2 MANUFACTURER AND LABELING

A. All paint shall be mixed material properly prepared by the manufacturer and delivered to the site for field painting in the original unbroken containers with the manufacturer's stamp and brand or formula of the contents plainly marked thereon. Containers shall be opened in the presence of the Engineer or his representative immediately before use. Locations for the storage of paint materials and equipment shall be selected with the view of reducing fire hazard to a minimum. Paints that are susceptible to freezing shall be stored above freezing temperatures.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION

A. All surfaces shall be fully and appropriately prepared prior to application of the paint to insure smooth finish and complete bonding. Machined surfaces, plates, lighting fixtures, and similar items in contact with painted surfaces and not be painted shall be removed, masked, or otherwise protected prior to surface preparation and painting operations. Nearby surfaces and other items shall also be adequately protected by covering or removing them. In general, any damage caused by the painting operation shall be the responsibility of the Painting Contractor and he shall make good any such damage.

1. All surfaces to be painted, coated, or sealed shall be clean, dry and free of dirt,

dust, oils, grease, wax, flaking, or loose paint, efflorescence and deleterious materials. All surfaces shall be cured a minimum of 28 days prior to application of a coating or sealer. All cracks, chips, and other defects in plain concrete surfaces shall be filled prior to coating or sealing.

2. Metal surfaces shall be prepared in accordance with the specification set forth in "Steel Structures Painting Manual, Volume 2, Systems and Specifications". Preparation shall be as set forth in paragraph 2.2 and shall be either SP-1 Solvent Cleaning, SP-6 Commercial Blast Cleaning, or SP-10 Near-White Metal Blast Cleaning. As soon after cleaning as practicable, and prior to the formation of any form of corrosion from atmospheric moisture or other causes, all metal surfaces to be painted shall be thoroughly treated with an inhibitive wash, applied by brush or spray and allowed to dry. The inhibitive wash shall be that recommended by the Paint Manufacturer and shall be applied in accordance with the manufacturer's recommendations. The inhibited surfaces shall then be given the priming coat of paint within 24 hours.

3. Time Between Preparation and Painting: Surfaces that have been cleaned, pretreated, and/or otherwise prepared for painting shall be given a coat of the specified first-coat material as soon as practicable after such preparation has been completed, but in any event, prior to any deterioration of the prepared surface, and within the manufacturer's specified time frame.

3.2 APPLICATION

A. The painter shall apply each coating at the rate specified for application by the manufacturer. If material has thickened or must be diluted for application by spray guns, the coating shall be built up to the same film thickness achieved with undiluted material. One gallon of paint as originally furnished by the manufacturer must not cover a greater square foot area when applied by spray gun than when applied by brush unthinned.

B. At time of application, paint shall show no signs of hard settling, excessive skinning, livering, or other deterioration. Paint shall be thoroughly stirred, strained, and kept at a uniform consistency during application. Paints of different manufacturers shall not be mixed together. Where necessary to suit conditions of surface, temperature, weather, and method of application, packaged paint other than cement-emulsion filler may be thinned immediately prior to application in accordance with the manufacturer's instructions and with the full knowledge of the Engineer, but not in excess of one pint of suitable thinner per gallon.

C. Proper ventilation must be maintained to promote drying. The buildings shall be free from dust during the painter's work. Paint and other coatings shall be kept sealed or covered when not in use. Oily waste, rags, etc., shall be collected each day and destroyed or stored in tight-covered metal containers.

D. Brushes shall be new and of the best grade, and size and type best adapted for the particular work. Brushes shall be kept clean and in perfect condition when not in use. Spraying equipment shall be of the type and capacity adapted to the work. Compressors shall be motor-driven and shall be set in locations and so connected and used as not to interfere with the work of other trades. All flexible hose, nozzles, and equipment shall be thoroughly cleaned after each day's work and maintained in first class working condition. The paint container shall be equipped with an efficient agitator.

E. All painting shall be done in the best manner by skilled workmen and in accordance with the paint manufacturer's recommendations. All paint shall be thoroughly and smoothly applied or brushed out to a uniform film without runs or sags. Each coat of finish shall be given sufficient time to dry hard before application of the succeeding coat. The surface

shall be thoroughly dust clean immediately prior to the application of each coat.

F. Paint coats on metal, masonry, or concrete areas of considerable size (excepting floors) may be either brushed or sprayed on. If sprayed, the gun shall be operated by a skilled mechanic, the nozzle held perpendicular to the surface being painted, and the coats applied uniformly and in a manner that will bond the paint properly to the surface. Air spray application of paint shall be followed immediately with a paint brush applied along the vertical and lower horizontal edges of members and along all abutting surfaces, edges of connections to remove all surplus paint and to smooth out all runs. All sags in paint films wherever located shall be brushed out immediately.

G. Before starting any work, surfaces to receive paint finishes shall be examined carefully for defects which either cannot be corrected by the procedures specified herein, or which might prevent satisfactory painting results. Work shall not proceed until such damages are corrected. The commencing of work in a specific area shall be construed as acceptance of the surfaces, and thereafter the Contractor shall be fully responsible for satisfactory work as required by the Engineer.

H. The Contractor shall be responsible for providing correct temperature, adequate ventilation, and lighting in all areas where painting operations are in progress. Before painting is started, the Contractor shall broom clean and remove all excessive dust. After painting operation begins in any given area, broom cleaning will not be permitted. Cleaning shall then be done only with vacuum cleaning equipment.

3.3 COLORS AND SAMPLES

A. Colors of all finishes shall be set forth in a Color Schedule to be furnished by the Contractor and acquired from the paint manufacturer. The approved Color Schedule shall become a part of these specifications. Samples shall be submitted to the Engineer for approval not less than four weeks before any painting will start. Rejected samples shall be resubmitted until approved. Approval shall be obtained in writing before materials are delivered to job site.

1. Concrete and Masonry Block: Specimens shall be at least eight inches square on pieces of concrete and masonry block used in the work, with each so include specified prime coats, base coat, and final coats.

2. Metals: Specimens shall be at least four inches square on sheet metal with each specimen to include prime coat, intermediate and finish coats.

END OF SECTION 099100

SECTION 099300
TRANSPARENT FINISHES

PART 1 - GENERAL

1.1 SUMMARY

A. The work in this section consists of furnishing, hauling, storing, and application of transparent finishes, including concrete and masonry sealers, to structures as described herein, and all equipment, tools, labor, and incidentals necessary to complete this section.

1. Exterior Above Grade Concrete: Shall be applied to all exterior, above grade concrete walls, whether masonry, cast-in-place, or precast.

B. Related Work:

1. Section 099100 - Painting

1.2 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Product Data: Provide manufacturer’s product data and specifications verifying compliance with specified requirements.

1.3 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to site in manufacturer’s original packaging with labels clearly indicating manufacturer and material.

B. Store materials in a dry, protected, well-vented area, protected from damage and in accordance with manufacturer’s instructions.

C. Protect materials during handling and installation to prevent damage.

1.4 BASIS OF PAYMENT

A. Measurement: Complete product in place per lump sum

B. Items included: As indicated and required for a complete installation.

PART 2 - PRODUCTS

2.1 EXTERIOR CONCRETE SLAB SEALER

A. Shall be an acrylic polymer and copolymer solution that produces a hard, flexible, clear film upon drying. Sealer shall be non-yellowing, non-hazing, salt resistant, and shall be able to bridge and seal hairline cracks and voids. Sealer shall be CONSPEC Super Seal or approved equal.

2.2 EXTERIOR ABOVE-GRADE CONCRETE SEALER

A. Shall be penetrating alkylalkoxysilane solution designed for maximum water repellency without altering substrate appearance. Sealer shall be SONNEBORN PENETRATING

SEAL, SUREKLEAN WEATHER SEAL SILOXANE, or approved equal.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION

A. Concrete: Surface to be sealed shall be dry, structurally sound, clean and free of dirt, loose mortar particles, paint, films, protective coatings, efflorescence, laitance, etc. Concrete shall be carefully formed to provide smooth surface, shall be given a smooth rubbed finish, and shall not have residual form treatments present which might stain or otherwise injure the concrete or prevent a good bond for sealer. Concrete shall have cured a minimum of 28 days prior to application of sealer.

3.2 APPLICATION

A. Concrete Sealer: Shall be applied with brush, spray, or roller as appropriate for concrete being sealed. Application shall be in accordance with manufacturer's instructions. Area sealed shall be protected from traffic until fully cured.

3.3 MANUFACTURER AND LABELING

A. All sealers shall be mixed material, properly prepared by the manufacturer and delivered to the site for field application in the original unbroken containers with the manufacturer's stamp and brand or formula of the contents plainly marked thereon. Containers shall be opened in the presence of the Engineer or his representative immediately before use. Locations of the storage of materials and equipment shall be selected with the view of reducing fire hazard to a minimum. Sealers that are susceptible to freezing shall be stored above freezing temperatures.

END OF SECTION 099300

SECTION 251116
REMOTE MONITORING AND REPORTING

PART 1 - GENERAL

1.1 SUMMARY

A. The work of this section consists of furnishing and installing a self-contained, completely automatic solid state monitoring and alarm system, and includes all tools, labor, supervision, equipment, and incidentals necessary for a complete and functioning system.

B. Related Work:

1. Section 444629.13 – Sludge Pump (Submersible Type)

1.2 SUBMITTALS

A. Submit under provisions of Section 013300.

1.3 BASIS OF PAYMENT

A. Measurement: Complete product in place per lump sum.

B. Items included: As indicated and required for a complete installation.

PART 2 - PRODUCTS

2.1 MATERIALS

A. One (1) system shall be supplied. The unit shall be connected and programmed to warn of each of the following conditions:

1. Power outage at lift station

2. High water level in wetwell

3. Pump No. 1 Starter Fail

4. Pump No. 2 Starter Fail

B. The monitoring system shall be housed in pump control panel cabinet with provisions for cabinet mounting. The system shall be provided with continuously float-charged batteries with 24-hour standby operation in the event of a power outage, and a condensation heater and thermostat built into the enclosure. The unit shall be operational over the temperature range of 0° to 130°F and shall operate on 120 VAC.

C. Unit shall be Sensaphone Sentinel moniting system with cellular modem, as manufactured by Sensaphone Remote Monitoring Solutions, or approved equal.

PART 3 - EXECUTION

3.1 OPERATION

A. The system shall be capable of monitoring four (4) independent alarm conditions. The status of the alarm conditions shall be indicated by a set of normally closed dry contacts. The system shall be capable of multiple fault reporting in one call, text, and email.

B. The system shall operate on a standard dial up telephone line. No leased or full period telephone circuits shall be required. The system shall contain its own FCC approved telephone coupler and shall connect to the telephone network with a standard modular plug. Unit shall be capable of being modified at factory for standard dial systems.

C. The monitoring system shall, upon opening any one of the alarm points, access cellular modem, wait for dial tone, and begin to dial the first of four (4) field programmable telephone numbers, each to sixteen digits in length.

D. After dialing any of the four telephone numbers, the system shall deliver a voice message indicating the location and fault status at the lift station. The message shall be repeated six times, with a sufficient space between message transmissions, to allow the called individual to acknowledge receipt of the call. Acknowledgment of the message shall be accomplished by pressing a touch-tone key on the telephone between message transmission or by placing a telephone call back to the system.

E. The voice message shall be electronically synthesized with no tapes or mechanical reproduction elements whatsoever. The system shall contain, upon delivery, its own vocabulary sufficient to clearly advise personnel of the status and operating conditions within the monitored location.

F. Alarm and normal messages for each channel shall be programmable from a minimum 450 word vocabulary.

G. Following an acknowledgment, the system shall vocalize a sign-off and hang up. The system shall then enter a delay to allow adequate time for follow-up corrective measures to be taken. The delay is keyboard programmable from .1 to 99 hours.

H. If the delay elapses and faults exist, the system shall begin dialing again at 2-minute intervals attempting to deliver the fault message.

I. If no acknowledgment is received (due to no answer, busy, etc.) the system shall hang up, wait 60 seconds for cleardown, and call the next priority telephone number.

J. At any time the system receives an incoming call, it shall answer the call and deliver, in a voice message, the location and fault status information at that location.

K. Telephone numbers shall be programmed into the system by means of web site remote access. It shall not be necessary to remove the system from service to reprogram telephone numbers.

L. The monitoring system shall have data logging with unlimited samples stored securely on a server with programmable samples ranging from 1 minute to 24 hours accessed via website remote access.

SECTION 260500
BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section covers basic electrical materials and methods including:

1. Conduit, fittings, and accessories.
2. Wire, cable, connectors, and markers.
3. Boxes.
4. Wiring devices.
5. Supporting devices.

B. Related Work:

1. Section 262816 - Electrical Distribution Equipment
2. Section 312333 - Trenching and Backfilling for Utilities

C. References:

1. American National Standards Institute (ANSI):

a. ANSI C80.1 - Specification for Rigid Steel Conduit, Zinc-Coated
b. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc-Coated
c. ANSI C80.4 - Fittings for Rigid Metal Conduit and Electrical Metallic Tubing

2. Federal Specifications (FS):

a. FS A-A-50552 - Fittings for Cable, Power, Electrical and Conduit, Metal, Flexible
b. FS A-A-50553 - Fittings for Conduit, Metal, Rigid (Thick-Wall and Thin-Wall (EMT) Type)
c. FS A-A-50563 - Conduit Outlet Boxes, Bodies and Entrance Caps, Electrical
d. FS A-A-55810 - Flexible Metal Conduit

3. National Electrical Manufacturers Association (NEMA):

a. NEMA FB 1 - Fittings and Supports for Conduit and Cable Assemblies
b. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers and Box Supports
c. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit
d. NEMA TC 2 - Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80)
e. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing

f. NEMA WC 5 - Specific Purpose Wiring

4. Underwriter’s Laboratories, Inc.(UL):

a. UL 1 - Standard for Safety Flexible Metal Conduit

b. UL 6 - Standard for Safety Electrical Rigid Metal Conduit - Steel

c. UL 360 - Standard for Safety Liquid-Tight Flexible Metal Conduit

d. UL 486A - Standard for Safety Wire Connectors and Soldering Lugs for Use with Copper Conductors

e. UL 514A - Standard for Safety Metallic Outlet Boxes

f. UL 514B - Standard for Safety Conduit, Tubing, and Cable Fittings

g. UL 651 - Standard for Safety Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings

h. UL 797 - Standard for Safety Electrical Metallic Tubing - Steel

1.2 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Submit manufacturer’s product data sheets verifying compliance with specified requirements.

1.3 QUALITY ASSURANCE

A. All work shall be done in accordance with the latest rules and regulations of the National Electrical Code, the National Electrical Safety Code, and the local authorities having jurisdiction over this class of work. Strict compliance therewith will be required for all electrical work, except where the drawings and specifications require better materials, equipment, and construction than these minimum standards, in which case, the drawings and specifications shall precede the Code requirement.

B. Contractor shall complete and make operable the electrical systems of all equipment and devices shown on the drawings. This consideration shall include all electrical interconnections, home runs, and services. Contractor shall provide an operational and functional check of the electrical systems involved.

C. Contractor shall install, connect, and complete all equipment and devices as per manufacturer's certified drawings approved by Engineer.

D. All work, selection of materials, ratings, capacities and methods of construction shall be approved by the Engineer in writing before work is started.

E. The Bidder may request to furnish equivalent items ONLY by submitting his request in writing to the Engineer no later than 14 days prior to bid opening. The Engineer will review the request, and if the items are deemed equivalent, approval will be made in writing.

F. All control circuits shall operate at a nominal voltage not to exceed 120 volts to ground and shall be obtained from a fused 120 volt circuit or a transformer with an isolated secondary winding, with primary power taken from a source on the load side of the main disconnect device. One side of the control circuit shall be grounded, and the ungrounded side shall be properly fused at the point of transformation or supply.

G. Materials and equipment shall meet the applicable requirements of NEMA, ANSI, IEEE, and the latest edition of IPCEA Publication #S-19-81, as specified.

H. Materials and equipment of the types for which there are Underwriters' Laboratories Standard requirements, listings, and labels shall have listing of Underwriters' Laboratories and be so

labeled, or shall conform to the requirements, in which case, certified statements to the effect shall be furnished, if requested. Use new materials and equipment.

I. Materials other than those listed shall be the size, type, and capacity indicated by the drawings and the specifications. Insofar as possible, use one type and quality.

1.4 SCOPE OF WORK

A. The work covered by the specification shall include furnishing all labor, materials, equipment, and services to construct the complete electrical system as shown on the accompanying plans and as specified herein. The work, in general, includes the following principle items:

1. The complete installation of service equipment rack, meter disconnect, meter, and service disconnect. At this time the contractor shall coordinate with Evergy for removal and replacement of existing 120/208 volt 3 phase padmount transformer. The new padmount transformer shall be 480/277 volt 3 phase.

2. The complete equipment rack, pump control panel, manual transfer switch, LPA panel, and generator receptacle,(To match the City of Nevada existing portable generator plug).

3. The complete conduit and wiring system for pump control panel, floats, and submersible pumps.

4. All demolition of existing equipment as shown in drawings (National Guard shall retain existing electrical equipment)

1.5 DRAWINGS

A. The design drawings, which constitute an integral part of this contract, shall serve as the working drawings. They indicate the general arrangement and are generally diagrammatic; and locations of outlets and equipment shall be governed by structural conditions and obstruction. This is not to be construed to permit redesigning systems. All outlets shall be interconnected as shown on the drawings.

B. The Contractor shall review the plans of all phases of this project and shall adjust his work to conform to all conditions indicated thereon.

C. All modifications or relocations shall be approved by the Engineer prior to actual work.

D. The Contractor shall submit complete connection and schematic wiring diagrams, including a complete list of materials and components used in the electrical system for approval.

E. Data on all material and equipment to be incorporated into the project shall be electronically submitted to Engineer for approval as specified in the General Conditions. This includes all conduit, conductor, fitting, fixture, etc.

F. The Engineer will subsequently review all data presented and will make the necessary approval in writing.

G. After approval is granted on material and equipment, the Contractor may then install the equipment in the project.

1.6 PHASING OF WORK

A. The Contractor shall undertake all electrical work in a manner that assures that the operation lift station remains unaffected by construction of the electrical systems. Any required temporary work, including equipment, materials, labor, incidentals, and appurtenances shall be considered a part of these specifications.

B. Contractor shall not be allowed additional compensation, nor additional time beyond that reflected in the Contractor’s bid for such temporary electrical installations.

C. All electrical equipment removed from the existing wastewater lagoon during all phases of

renovation shall be the sole property of the Army National Guard.

D. All salvaged materials shall be removed by the Contractor to a place of storage designated by the Owner, or, at the Owner's option, shall be disposed of by the Contractor at no additional cost to the Owner.

E. All temporary installation of electrical equipment shall be made in accordance to requirements of the 2023 N.E.C.

F. Only (1) pump can be taken offline at a time.

1.7 BASIS OF PAYMENT

A. Measurement: Complete product in place per lump sum

B. Items included: As indicated and required for a complete installation.

PART 2 - PRODUCTS

2.1 DEFECTIVE MATERIALS AND WORKMANSHIP

A. The acceptance of any materials, equipment, or any workmanship by the Engineer shall not preclude the subsequent rejection thereof if such materials, equipment, or workmanship shall be found to be defective after delivery or installation, and any such materials, equipment, or workmanship found defective before final acceptance of the construction shall be replaced or remedied, as the case may be, by and at the expense of the Contractor. Any such condemned material or equipment shall be immediately removed from the site of the project by the Contractor at the Contractor's expense.

B. The Contractor shall not be entitled to any payment hereunder as long as any defective materials, equipment, or workmanship in respect to the project, of which the Contractor shall have had notice, shall not have been replaced or remedied, as the case may be.

C. Notwithstanding any certificate which may have been given by the Engineer, if any materials, equipment, or any workmanship which does not comply with the requirements of this contract shall be discovered within one (1) year after completion of construction of the project, the Contractor shall replace such defective materials or equipment, or remedy any such defective workmanship within thirty (30) days after notice in writing of the existence thereof shall have been given by the Owner.

D. If the Contractor shall be called upon to replace any defective materials or equipment, or to remedy defective workmanship as herein provided, the Owner, if so requested by the Contractor, shall de-energize that section of the project involved in such work. In the event of failure by the Contractor to do so, the Owner may replace such defective materials or equipment, or remedy such defective workmanship, as the case may be, and in such event, the Contractor shall pay to the Owner the cost and expense thereof.

2.2 CONDUIT, FITTINGS AND ACCESSORIES

A. Conduit For Electrical Systems

1. All conduit shall be low carbon, hot dipped galvanized, heavy wall, or rigid polyvinyl chloride heavy wall conduit, as specified.

2. All conduit shall bear the Underwriters' Label of approval and shall be manufactured according to American Standards Association Specifications.

3. Minimum size of conduit shall be three-fourths (3/4) inch, except as specifically noted on the plans.

4. Flexible conduit and fittings shall be used to complete the final twenty-four (24) inches of connection to rotating machinery, transformers, and other equipment subjected to movement or vibration. Flexible conduit shall be Type UA liquid-tight.

5. Special conduit fittings shall be appropriate for each application. Conduit systems shall be installed in accordance with the 2023 NEC Edition, and shall be installed in a neat and workmanlike manner.

B. Conduit Supporting Accessories:

1. Supports for conduit shall consist of conduit clamps of an approved type, conduit hangers, pipe hangers designed for attachment to steel beams, aluminum strut trapeze with threaded rod hangers, or wall brackets as required to suit special conditions.

2. Rigid aluminum conduit exposed inside and outside, mounted to steel beams and/or mounted on concrete block or steel surfaces shall utilize rigid aluminum straps with conduit spacers and nest backs fastened to malleable iron beam clamps manufactured by Ozgedney, Crouse Hinds, Appleton, Killark, or an approved equal.

3. All strut rack systems shall be aluminum or stainless steel, and shall comply with ASTM Al 23.

4. Strut systems shall be bolted with approved fittings, stainless steel bolts, locking washers, nuts, spring nuts, and/or twirl nuts. The use of slotted strut is prohibited.

2.3 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS, CABLES, AND ACCESSORIES

A. Wire and Cable:

1. All wire and cables shall be of copper, and shall comply with the standardization rules of the IEEE as to conductivity and shall be free from kinks and defects when installed.

2. Conductors shall be in accordance with the requirements of IPCEA Publications S-19-81, latest edition.

3. Sizes and types as indicated on the drawings or scheduled herein are for copper conductors

4. No aluminum wire shall be installed without approval in writing from the Engineer

5. Wire:

a. Minimum wire size shall be No. 12 AWG and shall have six hundred (600) volt insulation unless otherwise specified.

b. Insulated wire and cable shall have size, type of insulation, voltage, and manufacturer’s name permanently marked on outer covering at regular intervals not exceeding four feet.

c. Wire and cable shall be delivered in complete coils or reels with identifying tags, stating size, type of insulation, voltage, and manufacturer’s name.

d. Wire and cable shall be suitably protected from weather and other damage during storage and handling, and shall be in first class condition after installation.

e. Conductors shall be soft drawn copper ASTM B3 for solid wire, ASTM B8 for stranded conductors.

f. Conductor wire sizes shall be American Wire Gauge (AWG); all wire of #8 and larger shall be stranded for “Conduit” work.

g. All conductors shall be rated 600 volts unless otherwise specified or shown on the drawings.

h. Power wiring shall be THWN, THHN, unless otherwise specified.

i. Conductors in hazardous areas shall be Type RHW or XHHW.

j. All control wiring shall be Type THW or THWN unless otherwise specified.

k. Control cable shall be made up of 7 strand copper conductors with 20-mils of polyethylene insulation of 10-mils of color coded PVC covering on each conductor, enclosed in a flamenol jacket overall.

l. All direct buried cable shall be Underwriters' Type USE, 75°C, 600 volt, with thermosetting polyethylene insulation.

B. Terminal Lugs:

1. All equipment which is not furnished with connectors shall be provided with approved AL-CU lug-Type terminal connectors.

C. Connectors:

1. Branch Circuits
   a. Each 120 volt branch circuit must be provided with a neutral wire, and in no case may the neutral wire be interrupted or fused. Common neutrals may be used as permitted by the NEC.

   b. Branch circuits shall be installed in conduit, and shall meet all applicable provisions of 2023 NEC.

2.4 LOW VOLTAGE DISTRIBUTION TRANSFORMERS

A. General:

1. This section includes general purpose and specialty dry type transformers with windings rated 600V or less.
2. Factory assembled and tested, air cooled units of types specified, having characteristics and ratings as indicated.
3. Units shall be designed for 60 Hz service.

B. Construction:

1. Transformers, dry type, shall comply with NEMA standard ST20, "Dry Type Transformers for General Applications".
2. Contractor shall provide all copper windings.
3. Transformers shall have the following features and ratings:

   a. Enclosure: Indoor, ventilated.

   b. Insulation Temperature Rise: 115°C maximum rise above 40°C for transformers rated 3KVA through 10KVA.

   c. Insulation Temperature Rise: 150°C rise maximum rise above 40°C, for transformers rated 15 KVA through 1000 KVA.

   d. Taps: For transformers 3KVA and larger, full capacity taps in high voltage winding as follows: 3KVA through 10KVA; two 5% taps below rated high-voltage. 15KVA through 500KV; six 2-1/2% taps, 2 above and 4 below, rated high-voltage. 750-1000 KVA; four 2-1/2% taps, 2 above and 2 below rated high voltage.

C. Protection:

1. Transformers shall be stored in a space that is continuously under normal control of temperature and humidity. Apply temporary heat in accordance with manufacturer's recommendations within enclosure of each transformer throughout periods during which equipment is not in use.

2.5 BOXES

A. Outlet and Device Boxes:

1. Boxes shall be formed from sheet steel, with comers folded in and securely welded, with one inch (1") inward flange on all four edges, with box drilled for mounting, and with flange drilled for attachment of cover.
2. Box shall be galvanized after fabrication.
3. Cover shall be made of one-piece galvanized steel, and provided with round head brass machine screws for fastening to box.

B. Junction Boxes:

1. Junction boxes located on equipment racks in pits, or manholes subject to the weather or corrosive environments shall be fiberglass reinforced non-metallic enclosures, suitable for indoor and outdoor applications.
2. Junction box construction shall meet NEMA/EEMAC Type 4, 4X, and 12 specifications.
3. Junction box shall be constructed of strong, molded fiberglass reinforced polyester construction with matching cover.
4. Lids shall have a gasket material made of closed cell neoprene cord, captive stainless steel cover screws, and stainless steel mounting hardware, with 10-32 threaded inserts for white or aluminum back panel with terminal strip.
5. Junction boxes shall be manufactured by Allied Moulded Products, Robroy, Inc., Hoffman, or an approved equal.

2.6 WIRING DEVICES

A. General:

1. Wiring devices shall be furnished and installed as specified and scheduled herein, or as approved.
2. This section includes the following: receptacles, ground fault interrupter receptacles, snap switches, and wall plates.
3. Provide wiring devices, in types, characteristics, grades, colors, and electrical ratings for applications indicated, which are UL listed and comply with NEMA standards.

B. Receptacles:

1. Receptacles located outside or in corrosive environments shall be constructed of a high visibility yellow, impact-resistant, thermoplastic cover and a one-piece, 0.050' thick, locked in brass mounting strap, with integral ground contacts and 0.0003" nickel plating on surface of contacts. All metal parts shall be non-magnetic, electroless nickel-plated brass.
2. Ground fault interrupter receptacles shall conform to UL Standard 943, Class A (GFCI) and 498 (receptacle) with a temperature tolerance range of -32°F to 158°F and to trip at 5mA (±

1 mA) threshold.

C. Snap Switches:

1. Snap switches shall be constructed of silver alloy contacts and an extra wide rust resistant strap.
2. Terminals shall have a large brass binding head terminal that will accept up to No. 10 CU wire.
3. Switches shall be industrial specification Grade, and UL Listed, CSA certified, and comply with UL 20.

D. Cover Plates:

1. Cover plates for outdoor use shall be constructed rain-tight so the integrity of the weatherproof enclosure is maintained when a plug is inserted into the device.
2. Covers shall be commercial specification grade. Covers shall be constructed of a tough polycarbonate construction to resist impact, and UV stabilized to maintain strength and color.
3. Covers shall be for vertical or horizontal devices, as scheduled herein.

2.7 SUPPORTING DEVICES

A. Fabricated from manufactured stainless steel framing members equal to Unistrut P-3000 Series as indicated.

B. Construct as required to rigidly support all conduit runs, boxes, switches, and panels.

C. Support all exposed metallic conduit with galvanized steel conduit clamps, sized for specific conduit size.

D. Support PVC coated metallic conduit with nonmagnetic conduit clamps, sized for specific conduit size.

E. Stainless steel support hardware including fittings, anchors, inserts, bolts, washers and nuts.

2.8 MOTORS AND MOTOR CONTROLS

A. Approved Manufacturers of Motor Control Cabinet Components:

1. Allen Bradley
2. Square D.
3. General Electric
4. Siemens
5. Cutler Hammer
6. Or Approved equal

B. Lift station pump motors shall be provided with fuses or horsepower rated circuit breakers and reduced voltage solid state starters with bypass as shown on drawings with electronic overload elements sized in accordance with the requirements of NEC.

C. Motor Starters:

7. See Section 444629.13.

D. Safety Switches and Contactors

1. These units shall be as scheduled herein, or as approved.
2. All safety switches shall be labeled with engraved phenolic nameplates indicating voltage, phase, and equipment served.

E. Control Cabinet:

1. The Control Cabinet enclosure type shall be in accordance with NEMA standards for NEMA Type 4X Gasketed stainless steel enclosure with removable access cover.
    a. Service Motor Control Cabinet shall be 277/480 volt, 3 phase, 4 wire, 60 Hertz
    b. All control switches, pilot lights, and alarm devices shall be weather proof and mounted inside on a swing out interior panel.
2. Disconnect Operators:
    a. An external operator handle shall be supplied for each switch or breaker.
    b. This mechanism shall be engaged with the switch or breaker at all times regardless of unit door position to prevent false circuit indication.
    c. The operator handle shall be color coded to display red in the "ON" position and black on the "OFF" position.
    d. The operator handle shall have a conventional up-down motion or rotary motion and shall be designed so that the down position will indicate the unit is "OFF".
    e. For added safety it shall be possible to lock this handle in the "OFF" position with up to three padlocks.
    f. The operator handle shall be interlocked with the unit door to prevent switching the unit to "ON' while the unit door is open.
    g. A defeater mechanism shall be provided for the purpose of defeating this interlock by a deliberate act of an electrician should he desire to observe the operation of the operator handle assembly or the unit components.
3. Circuit Breakers:
    a. Molded case circuit breakers shall be furnished in all starter and branch feeder units using circuit breakers as a disconnect means.
    b. All circuit breakers will have a push-to-trip test feature for testing and exercising the circuit breaker trip mechanism.
4. Identification:
    a. A control center identification nameplate describing section catalog numbers and characteristics shall be fastened on the vertical wire trough door of every section.
    b. Each control cabinet unit shall have its own identification nameplate fastened to the unit saddle.
    c. These nameplates shall have suitable references to factory records for efficient communication with supplier.
    d. Each control cabinet unit shall also have an engraved Bakelite nameplate fastened to the outside of the unit door for ease in identification and for making changes when regrouping units.

5. Finish:

    a. All metal structural and unit parts shall be completely painted using an electrodeposition process so that interior and exterior surfaces as well as bolted joints have a complete finish coat on and between them.

    b. The basic process shall consist of using an iron phosphate pretreatment for improvement of paint adhesion.

    c. The paint process shall consist of cleaning, rinsing, phosphating, 4 prepaint rinses, painting, 2 post paint rinses, a bake cure, and cool down.

    d. Paint shall be Acrylic-Melamine Electrodeposition Baked Enamel. Color as selected by the Engineer.

    e. Removable push button operator plates, flange mounted operator handles and trim plates, and top horizontal wire trough cover plates shall be painted a contrasting color.

2.9 ELECTRICAL IDENTIFICATION

A. Identification For Electrical Systems

1. Identification labeling shall be engraved, plastic-laminated labels, signs, and instruction plates: Engraving stock melamine plastic laminate, 1/16-inch minimum thick for labels and signs up to 20 square inches, or 8 inches in length; 1-1/8-inch thick for larger sizes. Engraved legend in white letters on black face and punched for mechanical fasteners.

B. Conductors for all power and lighting circuits shall be identified by the following color code:

	480Y/277V,3~~0~~	240/120V,3~~0~~	120/240 1~~0~~	208/120, 3~~0~~
Phase A	Brown	Black	Black	Black
Phase B	Orange	Orange-Red	Red	Red
Phase C	Yellow	Blue		Blue
Neutral Gray	White	White	White	White
Equipment Ground	Green	Green	Green	Green

PART 3 - EXECUTION

3.1 INSTALLATION OF CONDUIT

A. Polyvinylchloride Conduit:

1. Conduit must be installed at least twelve (12) inches from hot water piping in parallel runs, at least six (6) inches in cross runs, and at least three (3) inches from cold water piping.

2. Conduit shall in no case be secured to other piping, and where practical, shall be installed above other piping.

3. Exposed conduit runs, where allowed, shall be parallel or perpendicular to building walls.

4. Conduit shall be installed in an approved manner, and rigidly supported with approved conduit clamps.

5. Distance between conduit supports shall not exceed five (5) feet.

6. Drilling of, or welding to, building columns or main structure members for supporting means is not permissible.

7. The opening of all conduit fittings shall be readily accessible.

8. All metallic conduit shall be cut square and threads for rigid conduit shall be cut and cleaned before reaming.
9. All joints in rigid conduit shall be threaded fully and pulled tight with a wrench. Each underground joint shall be sealed with spray plastic for waterproofing and corrosion protection.
10. Conduit must be securely fastened to all outlet boxes with double locknuts to provide continuity of ground.
11. Bushings of approved make must be used, care being exercised to see that the full number of threads project through to allow the bushings to butt up tight against the end of the conduit.
12. Conduit shall be joined by approved couplings and shall have ends butted in all cases.
13. The use of running threads will not be permitted.
14. Where building construction or other conditions make it impossible to use standard threaded couplings, approved watertight conduit unions shall be installed as to make a continuous bond between the conduits connected.
15. All ends of conduit shall be properly reamed to remove rough edges and whenever a conduit enters a box or other fittings, it shall be securely fastened by the use of a locknut inside and outside of the box or fitting.
16. An approved bushing shall be installed on the ends of all conduits in such a manner as to protect the wire from abrasion.
17. The contractor shall so lay out and install the conduit systems as to avoid all other services or systems, the proximity of which may prove injurious to the conduit or the wires or conductors which it confines.
18. All conduit systems except those otherwise specifically shown to the contrary, shall be concealed in the building construction.
19. All conduits with conductors exiting into areas without the use of boxes, shall be supplied and installed with insulating bushings as approved for this purpose, to protect the conductors from physical damage.
20. All polyvinylchloride conduit shall be cut square and joints made with an approved solvent cement.
21. A grounding conductor shall be installed in conduit to ensure continuity of ground.
22. All conduit and fittings installed outdoors shall be rain-tight and shall be pitched and drained as required by the National Electrical Code.
23. All underground conduit or ducts, where not located below the frost line, shall be arranged to drain in accordance with the NEC.
24. All conduit installed below grade or encased in concrete shall be rigid galvanized or polyvinyl chloride.
25. Conduit fittings and elbows shall be rigid galvanized or malleable.
26. All conduit installed indoors shall be PVC Coated Rigid, unless otherwise indicated.
27. All conduit installed above grade outdoors shall be PVC rigid galvanized conduit.
28. All conduit for hazardous areas shall be of the rigid galvanized type with approved malleable fittings.
29. Conduit seals shall be installed in each conduit run entering an enclosure for switches, circuit breakers, fuses, relays, resistors, or other apparatus which may produce arcs, sparks, or high temperatures. Seals shall be placed as close as practicable and in no case

more than 18" from such enclosures.

30. Seals shall also be placed in each conduit run entering or leaving hazardous area.
31. There shall be no union, coupling, box, or fitting in the conduit between the sealing fitting and the point at which the conduit leaves the hazardous area.
32. All underground conduit not encased in concrete shall be buried a minimum twenty-four (24) inches deep.
33. PVC conduit shall further be laid in a bed of sand with a minimum of two (2") inch coverage top and bottom, with plastic utility marking tape above conduit at 8" below finished grade.
34. Right angle turns shall consist of symmetrical bends of rigid galvanized.
35. PVC right angle turns shall not be utilized.
36. Bends and offsets shall be avoided wherever possible.
37. Field bends shall be made so as to avoid changing the internal diameter of the conduit and so as not to damage it protective coating either outside or inside.
38. Bends shall be free from kinks, indentation, or flattened surfaces and shall be made with approved conduit bending machines or devices, in accordance with recommended radii per the NEC.
39. No more than four (4) ninety (90) degree bends will be allowed in any one conduit run.
40. Where more bends are necessary, a suitable pull or junction box shall be installed, but not on a building expansion joint.
41. All junction boxes shall be sized in accordance with the NEC.

3.2 WIRES AND CABLES

A. Direct Buried Conductors:

1. Direct buried conductors shall be installed so that the top conductor is at least two feet (2'-0") below finish grade.
2. The trench for cables shall be excavated three inches (3") below the bottom cable line and the trench shall then be backfilled to the first cable line with sand.
3. Cables shall then be installed, maintaining at least two inches (2") separation between cables.
4. Subsequent backfilling and cable installation shall then be made.
5. After the top layer of cables are installed, a three-inch (3") layer of sand shall be installed. The trench shall then be backfilled to within eight (8") inches of the surface. At this point, lay continuous underground magnetic utility marking tape with appropriate imprinting repeated every twenty-four inches (24") as manufactured by ALLEN UNDERGROUND DIVISION OF GRIFFOLYN COMPANY, INC., or approved equal.
6. After the marking tape has been laid, the trench shall be backfilled and tamped.

B. Wiring Connections and Terminations

1. All conductors shall be continuous from box to box and no splices shall be made in the conduit.
2. All splices, taps, or connections shall be soldered or joined by mechanical means, 3M, or equal.

3. All contact surfaces shall be cleaned to assure maximum conductivity.
4. When 20 ampere branch circuits exceed sixty-five (65) feet of conductor length one-way, the wire size shall be increased to #10 AWG. For lengths in excess of one hundred (100) feet, the wire shall be increased to #8.
5. Branch circuits shall be wired so that the neutral and the ground conductors are continuous, and will not be interrupted by removal of any fixture, receptacle, or other device.

C. Electrical Identification:

1. Identification labeling for panelboards, disconnects, motor control centers, transformers, and electrical-related signs:

   a. Apply equipment identification labels of engraved plastic-laminate on each major unit of electrical equipment.
   b. Labels shall be one-inch (1") high, three-inches (3") wide, 1/16-inch thick with 1/4-inch lettering.
   c. Text shall match terminology and numbering, as schedules and drawings indicate.
   d. Apply labels for each unit of the following categories of electrical equipment: Panelboards, electrical cabinets, enclosures, electrical switchgear, disconnect switches, pump panel, and transfer switch.

2. Conductors: Unless otherwise noted, equipment shall, in all cases, be wired so that on facing the front of the equipment, Phase "A" appears at the front, top or left, Phase "B" in the center and Phase "C" at the bottom, back, or right hand side.

   a. Identification of conductors, #8AWG and smaller shall be made by use of colored conductors only.
   b. Identifications of conductors of #6AWG and larger shall be made by use of colored conductors or colored plastic tape.
   c. If colored plastic tape is used for conductor identification, it shall be installed on conductors at every junction box and equipment enclosure.
   d. Control cable conductors shall be identified at the terminal designations in equipment to which it connects.
   e. Underground cables shall be properly identified as to phase by use of a non-corrosive metal tag at each end of the cable run.
   f. The metal tag shall be stamped with letters not less than one-half (½) inch in height.

3.3 LOW VOLTAGE DISTRIBUTION TRANSFORMERS

A. During installation, Contractor shall:

1. Utilize manufacturer’s standard wall brackets for transformers sized up to 75 KVA, where wall or ceiling mounting is indicated.
2. Utilize manufacturer’s standard rain shield where transformers are located outside.
3. Arrange transformers to provide adequate spacing for cooling air circulation.
4. Tighten electrical connectors and terminals in accordance with manufacturer’s published torque tightening valves. Where manufacturer’s torque valves are not indicated, use those specified in UL486A and UL486B.

3.4 BOXES

A. General:

1. Junction boxes and pull boxes shall be furnished and installed where indicated on the drawings, or as required by the 2020 NEC, or where necessary to facilitate pulling in wires and cables without damage to the conductors and cables.

3.5 WIRING DEVICES

A. Provide wiring devices as indicated on the drawings and as specified.

B. Install wiring devices only in electrical boxes which are clean and free from excess construction debris.

C. Install wiring devices after wiring work is complete.

D. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer’s published torque tightening values for wiring devices. Where manufacturer’s torquing requirements are not indicated, tighten connectors and terminals to comply with the tightening torques specified in UL Standard 486A.

E. Install device plates as indicated and specified.

F. Unless otherwise indicated, install wiring devices with centers at the following heights:

1. Indoor receptacles: 1'-4" above floor; 0'-8" above counter top.
2. Outdoor weatherproof receptacles: 2'-0" to 4'-0" above grade.
3. Wall switches: 4'-3" above floor.

3.6 SUPPORT DEVICES

A. Provide equipment supports as indicated on the drawings and as specified.

B. Construct with sufficient rigidity to hold all mounted equipment and material in permanent and neat alignment.

3.7 FIELD QUALITY CONTROL

A. Contractor shall provide labor, material, and test equipment, except as noted to the contrary herein, to test all wiring and equipment for continuity, proper polarity, proper phase relation, dielectric strength, operation and alignment after installation.

B. Test equipment and methods shall meet the Engineer's approval.

C. The Engineer shall be notified at least two working days prior to tests and reserves the right to witness any and all such tests.

D. The Engineer shall interpret test results and pass on the acceptability.

E. Contractor-supplied work which does not test out to the Engineer's satisfaction shall be corrected and re-tested as required without added cost to the Owner.

F. The Engineer reserves the right to perform any test on any phase of the installation utilizing Contractor's personnel and test equipment.

END OF SECTION 260500

SECTION 262816
ELECTRICAL DISTRIBUTION EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes equipment and materials for electrical distribution systems including:

1. Disconnect switches.
2. Secondary grounding.
3. Overcurrent protective devices.
4. Panelboards.

B. Related Work:

1. Section 260500 - Basic Electrical Materials and Methods

C. References:

1. National Electrical Code (NEC).
2. National Electrical Manufacturers Association (NEMA).
    a. NEMA KS 1 - Enclosed Switches.
    b. NEMA AB 1 - Molded-Case Circuit Breakers.
    c. NEMA ICS 2 - Industrial Control Devices, Controllers and Assemblies.
3. Underwriter's Laboratories, Inc. (UL).

1.2 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Furnish manufacturer's product data indicating electrical characteristics and verifying compliance with specified requirements.

C. Furnish dimensional drawings of equipment including spatial relationship to proximate electrical equipment.

D. Furnish power and control wiring diagrams. Clearly differentiate between portions of wiring that are manufacturer-installed and portions that are field-installed.

1.3 QUALITY ASSURANCE

A. Where Underwriter's Laboratories, Inc. has established standards for specified products, provide only products bearing the UL label.

B. Comply with NEC requirements as applicable to construction and installation of service and distribution systems.

1.4 BASIS OF PAYMENT

A. Measurement: Complete product in place per lump sum

B. Items included: As indicated and required for a complete installation.

PART 2 - PRODUCTS

2.1 GENERAL:

A. Provide distribution equipment and accessories of types, sizes, ratings and electrical characteristics indicated on the drawings.

2.2 DISCONNECT SWITCHES

A. Acceptable Manufacturers:

1. Square D.
2. Approved equal.

B. Switches shall be manufactured in accordance with the following standards:

1. UL98-Enclosed and Dead Front Switches
2. NEMA KSI - Enclosed Switches
3. NEMA 250 - Enclosures for Electrical Equipment.

C. All switches shall have switch blades that are visible when the switch is off and the cover is open (Type 4X)

D. Lugs shall be front removable and UL Listed for 75'C conductors from 30-1200 ampere copper conductors.

E. Switches required for Type 4-4X Stainless Steel. Applications shall have all copper current carrying parts.

F. All current carrying parts shall be plated to resist corrosion.

G. Switches shall have removable arc suppressors to facilitate easy access to line side lugs.

H. Switches shall have provisions for a field installable electrical interlock.

I. Switch Mechanism

1. Switch Mechanism: Shall be quick make, quick break, so that during normal operation of the switch, the operation of the contacts shall not be capable of being restrained by the operating handle after the closing or opening action of the contacts has started.
2. Provisions for padlocking the switch in the off position shall be provided.
3. The handle position shall travel at least 90 degrees between on and off positions to clearly indicate handle position.
4. All switches shall have a dual cover interlock mechanism to prevent unintentional opening of the switch cover when the switch is on, and to prevent turning the switch on when the cover is open. The cover interlock mechanism shall have an externally operated override, but the override shall not permanently disable the interlock mechanism.

J. Disconnect Switch Enclosures:

1. For NEMA Type 3R, 12, & 12K, the enclosure shall be finished with gray baked enamel paint that is electro-deposited on cleaned, phosphate pretreated galvanized steel.
2. For NEMA Type 1, the enclosure shall be finished with gray baked enamel paint that is electro-deposited on cleaned, phosphate pretreated steel.

3. The enclosure shall have on and off markings stamped into the cover.
4. Enclosures for Type stainless steel 4X switches through 200 ampere shall have provisions for interchangeable bolt on hubs in the top end wall

K. Switches shall be horsepower rated for AC circuits, as indicated on schedules and drawings.

2.3 EQUIPMENT GROUNDING

A. The equipment grounding conductor shall be sized in accordance with NEC Table 250-66, unless otherwise indicated.

B. Equipment grounding conductors shall be insulated, and shall be protected from mechanical damage by means equivalent to those provided for live conductors, and shall be green colored.

C. Flexible metallic conduits in excess of six and one-half (6-1/2') feet in length shall have an equipment grounding conductor installed unless conduit and connectors are UL approved as a grounding assembly.

D. Grounding Electrode System

1. Two (2) 5/8" x 8' ground rods shall serve as the main service entrance grounding electrode.

2.4 PANELBOARDS

A. Acceptable Manufacturers:

1. Square D, General Electric, Siemans, Cutler Hammer, or an approved equal.

B. Branch Circuit and Lighting Load Centers:

1. These units shall be as specified and scheduled herein, or as approved.
2. Cabinets, flush or surface mounted, as scheduled and drawings indicate.
3. All load centers shall be furnished with typed circuit directories unless otherwise specified.
4. All load centers shall have engraved phenolic nameplates, as specified.
5. In addition to the neutral bus, each new load center shall be furnished with a separate grounding bus, sized in accordance with 2023 NEC minimum requirements.

C. Panelboard Enclosures:

1. Enclosures shall be fabricated of cold rolled steel for NEMA Type 1, and galvanized steel for NEMA Type 3R.

a. Indoor NEMA Type 1 enclosures shall have cylinder tumble-type lock, all keyed alike, with finish to be gray baked enamel.

b. Outdoor NEMA Type 3R enclosures shall have a hasp to secure the cover, with finish to be gray baked enamel.

D. Interiors: NEMA PBI for NEMA Type 1 and NEMA Type 3R, as shown on drawings and as scheduled.

a. Bus bar connections to the branch circuit breakers shall be the distributed phase type and shall accept bolt-on circuit breakers.

b. Short circuit current ratings shall be provided according to the schedule. This rating shall be established by manufacturer's testing of a representative load center with branch circuit breakers installed.

c. Circuit breakers shall be (bolt-on) thermal magnetic trip, with an integral crossbar to ensure simultaneous opening of all poles in multi-pole circuit breakers.

d. Circuit breakers shall be UL listed in accordance with UL Standard 489, with current ratings as noted on the plans.

e. Single-pole 15 and 20 ampere circuit breakers intended to switch fluorescent lighting loads shall have the (SWD) marking.

f. Two- and three-pole circuit breakers 15 through 60 amperes intended for use with air-conditioning, heating, and refrigeration equipment having motor group combinations and marked as such, shall have the HACR marking.

g. Provide UL Class A ground fault interrupter circuit breakers where scheduled.

PART 3 - EXECUTION

3.1 GENERAL

A. Install service and distribution equipment, materials and devices as indicated, in accordance with the manufacturer's written instructions and with recognized industry practices to ensure that equipment, materials and devices fulfills requirements.
B. Comply with applicable installation requirements of NEC and NEMA standards.

3.2 INSTALLATION OF ELECTRICAL GROUNDING SYSTEM

A. All exposed non-current carrying metal parts of all equipment, receptacles, enclosures, conduits, motors and other devices and accessories, shall be bonded to a separate equipment grounding conductor.

B. The equipment grounding conductor and/or raceway shall be insulated from the grounded service conductor (neutral) except at the point of service entrance or supply.

C. Bonding:

1. The grounding terminal of each receptacle shall be bonded to the metallic outlet box with a bonding jumper or through the supporting screws where they are UL approved for this purpose.

2. The grounded service conductor (neutral) shall be bonded to the equipment grounding conductor, but only within the main disconnect.

3. This bonding jumper shall have an area of at least 12-1/2 percent of the area of one of the service entrance phase buses.

4. All grounding conductors installed in conduit shall be bonded to both ends of the conduit except where phase conductors are installed in the same conduit.

D. Grounding Electrode System:

1. Two (2) 5/8" x 8' ground rods shall serve as the main service entrance grounding electrode.

2. This ground shall be connected to the main ground bus in the main disconnect and perimeter ground by means of a bare, unspliced, stranded, copper conductor sized as shown on the Drawings.

E. Tests:

1. The Contractor shall check the ground resistance path in the presence of the Engineer or his representative, who shall pass on the acceptability of both the test instrument and the method of carrying out this test.

3.3 INSTALLATION OF DISTRIBUTION EQUIPMENT

A. Install distribution equipment including disconnect switches, over-current protective devices and panelboards at locations indicated and as follows:

1. Surface mount on walls or support devices approximately 4 feet to center line above floor or grade when possible. Anchor enclosures firmly, ensuring that they are permanently and mechanically secure.
2. Arrange with proper clearances from other equipment and material to obtain accessibility for operation and maintenance.
3. Coordinate with installation of conduits and wires.

B. Provide properly wired electrical connections within enclosures.

C. Install fuses in fused disconnect switches.

D. Provide engraved phenolic nameplates on cover of each device identifying the loads connected.

E. Provide type-written circuit directory card for each panelboard upon completion of installation work.

3.4 INSTALLATION OF PANELBOARDS

A. Mounting:

1. Mount panel plumb and rigid without distortion of box. Flush panels shall be uniformly flush with wall finish.
2. Top of trim 6’-6” shall be mounted above finished floor, unless otherwise noted.
3. Filler plates shall be installed in all unused spaces.
4. Provision for future circuits at flush load centers:

a. Stub two (2) ¾-inch empty conduits from load center into accessible ceiling space or space designated to be ceiling space in future.

b. Stub two (2) ¾-inch empty conduits into raised floor space or below slab outside of building, cap and seal conduits.

5. Wiring in Load Center Gutters:

a. Conductors shall be neatly grouped in bundles and wrapped with wire ties.

6. These units shall be Square D to match existing equipment.

3.5 FIELD QUALITY CONTROL

A. Upon completion of installation of service entrance and distribution equipment, energize circuitry and demonstrate capability and compliance with requirements.

B. Prior to energization of over-current protective devices, test devices for continuity of circuitry and for short-circuits.

C. Upon completion of electrical connections and after circuitry has been energized with rated power source, test connections to demonstrate capability and compliance with requirements. Ensure that direction of rotation of each motor fulfills requirements.

D. Where possible, correct malfunctioning units, then retest to demonstrate compliance. Otherwise, remove and replace with new units and retest.

END OF SECTION 262816

SECTION 311100
SITE PREPARATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section covers site preparation work including:

1. Clearing and grubbing.
2. Topsoil stripping and stockpiling.
3. Disposal of debris and waste material.

B. Related Work:

1. Section 312200 - Grading
2. Section 312300 - Excavation and Fill
3. Section 312316 - Excavation and Backfilling for Structures
4. Section 312333 - Trenching and Backfilling for Utilities

1.2 BASIS OF PAYMENT

A. Work under this Section shall be considered incidental to other related work and no measurements or direct payment will be made.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Topsoil is defined as selectively excavated surface soil that is representative of local soils that produce heavy growths of crops, grass or other vegetation. Satisfactory topsoil is reasonably free of underlying subsoil, clay lumps, weeds, litter, brush, matted roots, toxic substances or any material harmful to plant growth or which would hinder grading, planting, or maintenance operations. Topsoil shall not contain more than 5% by volume of stones or other such objects larger than 1/2" in any dimension for lawn seeded areas and 1" in any dimension in other seeded areas.

PART 3 - EXECUTION

3.1 CLEARING AND GRUBBING

A. Clearing includes removal of trees, brush and other vegetation interfering with installation of new construction.

B. Grubbing includes removal of tree stumps and roots greater than 2" in diameter to a minimum depth of 12" below existing grade elevation.

C. Fill all depressions caused by clearing and grubbing operations with satisfactory fill material unless further excavation or earthwork is indicated. Place fill material in horizontal layers not exceeding 8" loose depth and thoroughly compact to a density equal to original adjacent ground.

D. Confine clearing and grubbing operations within limits of easements and property lines indicated on the drawings.

E. Conduct Work in a manner to prevent damage to adjacent property and existing improvements, and to provide for the safety of workmen and others.

3.2 TOPSOIL STRIPPING AND STOCKPILING

A. Strip topsoil from excavation limits of the construction area and stockpile in areas where it will not interfere with construction operations or existing facilities.

B. Strip to whatever depths encountered in a manner to prevent intermingling with underlying subsoil or other objectionable material.

C. Scrape areas clean of all grass, weeds, brush, roots and other materials prior to stripping.

D. Where trees are designated to be saved, stop stripping at a sufficient distance to prevent damage to main root system.

E. Segregate and stockpile topsoil adjacent to the Work for subsequent use in finish grading and site restoration. Unless otherwise specified, any excess topsoil not used in the Work shall remain the property of the Owner. Stockpile and stabilize on-site as directed by the Owner's Representative.

3.3 DISPOSAL OF DEBRIS AND WASTE MATERIAL

A. Burning of combustible debris and waste material from clearing, grubbing, and stripping operations will not be permitted on the job site.

B. Dispose of all combustible and non-combustible debris and waste material at an off-site location arranged for by Contractor.

END OF SECTION 311100

SECTION 312200
GRADING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes the following:

1. Site rough grading.
2. Site fine grading.
3. Spreading and grading topsoil.
4. Protection of work.

B. Related Work:

1. Section 311100 - Site Preparation
2. Section 312300 - Excavation and Fill
3. Section 312316 - Excavation and Backfilling for Structures
4. Section 312333 - Trenching and Backfilling for Utilities
5. Section 321540 - Aggregate Surfacing
6. Section 329200 - Turf and Grasses

1.2 BASIS OF PAYMENT

A. Measurement: Work under this Section shall be considered incidental to other related work and no measurements or direct payment will be made.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Satisfactory Soil Material: Job excavated material that is free of debris, roots, stumps, organic matter, and frozen material, and is free of stones or rock fragments greater than 4" in any dimension.

B. Topsoil: Specified in Section 311100.

C. Unsatisfactory soil materials include organic silts and clays, peat and materials of any kind that are determined by Engineer to be too wet or otherwise unsatisfactory.

D. Waste materials includes excess usable materials and materials unsuitable for use in the Work.

PART 3 - EXECUTION

3.1 SITE GRADING

A. General: Complete all excavation, fill, compaction and rough grading as required to bring project area to proper subgrades at the elevations, slopes, cross sections and contours indicated.

1. Provide a smooth transition between adjacent grades and new grades.

2. Cut out soft spots, fill low spots, and trim high spots to comply with required surfaces.

B. Rough Grading: Uniformly grade areas to a smooth surface, free of irregular surface changes. Slope grades to direct water away from buildings and to prevent ponding.

1. Degree of finish shall be that ordinarily obtained with blade grader or other power equipment except as otherwise specified.
2. Finished rough grades shall generally be within 0.50' of established grades with due allowance for topsoil.
3. Finished rough grades within 20' of structures and surfaced areas shall be within 0.15' of established subgrades.

C. Fine Grading: Unless otherwise indicated, slope grades to provide effective drainage away from structures in all directions at a grade not less than 1%.

1. Finish subgrades to required elevations within the following tolerances:
   a. Turf or Unpaved Areas: Plus or minus 1".
   b. Walks: Plus or minus 1".
   c. Pavements: Plus or minus ½".
2. Grading Inside Building Lines: Finish subgrade to a tolerance of ½" when tested with a 10' long straight edge.
3. Finish all ditches, swales and gutters to drain readily.
4. Final grades and adjacent transition areas shall be reasonably smooth and even and free from irregular surface changes.
5. Remove all stones and rock fragments greater than 1" in size and dispose off-site.

D. Spreading and Grading Topsoil:

1. After completion of fine grading place topsoil on all areas disturbed or damaged by construction operations and not designated to receive other surfacing to a depth of at least 4".
2. Use topsoil obtained and stockpiled for such purpose under Section 311100 Site Preparation to the extent available.
3. Provide additional topsoil from approved borrow sites as necessary to complete the Work.
4. Loosen subgrade by discing or scarifying to a depth of at least 2" to insure adequate bond of the topsoil with the subgrade.
5. Place topsoil without specific compaction other than that obtained with spreading equipment.
6. Shape cuts, fills and embankments to the elevations, slopes, cross-sections and contours indicated on the drawings.
7. Transition final grades to match adjacent areas and provide effective drainage.
8. After topsoil has been placed and shaped to final grades, remove all stones or other objects greater than 1" in any dimension and any other objectionable material that may interfere with seeding operations.

3.2 PROTECTION OF THE WORK

A. Maintenance:

1. Protect newly graded and top soiled areas from the elements until grass is established.

2. Repair eroded areas with satisfactory topsoil and re-establish final grades.

END OF SECTION 312200

SECTION 312300
EXCAVATION AND FILL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Excavation as required.
2. Handling, storage and disposal of all excavated material.
3. Pumping and dewatering as required.
4. Preparation of subgrades.
5. Construction of fills and embankments.
6. Quality control.
7. Protection of work.

B. Related Work:

1. Section 311100 - Site Preparation
2. Section 312200 - Grading
3. Section 312316 - Excavation and Backfilling for Structures
4. Section 312333 - Trenching and Backfilling for Utilities

C. References:

1. ASTM International (Formerly American Society for Testing and Materials):

a. ASTM D422 - Standard Test Method for Particle Size Analysis for Soils

b. ASTM D698 - Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5 lb. (2.49 Kg) Rammer and 12-in (305-mm) Drop

c. ASTM D2167 - Standard Test Methods for Density and Unit Weight of Soil in Place by the Rubber Balloon Method

d. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

e. ASTM D2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods

f. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

g. ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils

h. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

1.2 SUBMITTALS

A. Submit as under provisions of Section 013300.

B. Material Test Reports:

1. For each on-site and borrow material proposed for fill and backfill as follows:

a. Standard Proctor Curve, ASTM D698.

b. Liquid Limit and Plastic Limit, ASTM D4318.

c. Insitu Moisture Content.

d. Material Description.

e. Particle Size Analysis, ASTM D422.

f. Soil Classification, ASTM D2487.

1.3 PROJECT CONDITIONS

A. Existing Conditions: Accept the Project site in the condition which it exists at the time of the award of the contract and perform all work to the grades indicated.

B. Existing underground, surface, and overhead utilities and structures are shown on the drawings in approximate locations as determined from existing construction drawings and data or surface observations. Not all utilities and structures may be shown. Contractor shall verify the exact horizontal and vertical location of existing utilities and structures prior to commencing installation of new construction.

C. Locate existing underground piping and utilities in areas of Work. If piping and utilities are to remain in place, provide adequate means of protection during earthwork operations.

1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult Owner and Engineer immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility Owner.

2. Do not interrupt existing utilities serving facilities occupied and used by Owner or others unless permitted in writing by the Owner and then only after acceptable temporary utility services have been provided. Provide a minimum of 48-hour notice to utility companies and receive written notice to proceed before interrupting any utility.

1.4 PROTECTION

A. Safety: Provide protective measures necessary for the safety of workmen, to the public and adjacent property. Prevent cave-ins, collapse of walls, structures and slopes, both on and adjacent to the site.

B. Standards: Comply with regulations of local authorities having jurisdiction, including all applicable OSHA requirements.

C. Repair: Includes the removal and replacement with new materials affected by settlement.

1.5 QUALITY ASSURANCE

A. Geotechnical Testing Firm Qualifications: Qualified according to ASTM E329 and ASTM D3740 for testing indicated.

1.6 BASIS OF PAYMENT

A. Measurement: No measurements will be made for work under this Section. Payment will be made on a lump sum basis.

B. Items included: As indicated and required to complete the work.

PART 2 - PRODUCTS

2.1 EXCAVATION CLASSES

A. All materials encountered in excavations shall be unclassified regardless of type, composition, character and condition thereof. Any rock encountered shall be handled at no additional cost to Owner.

2.2 MATERIALS

A. Satisfactory materials for use in embankment and fills shall be free of debris, roots, stumps, organic matter and frozen material, and shall be free of stones or rock fragments greater than 4" in any dimension.

1. Cohesive materials include inorganic silts and clays generally exclusive of sands and gravel and are materials for which impact compaction will produce a well-defined moisture-density relationship curve.

2. Cohesionless materials include gravels, sands and gravel-sand mixtures generally exclusive of clayey materials; are free draining; and are materials for which impact compaction will not produce a well define moisture-density relationship curve. Maximum density by vibrating methods will generally be greater than by impact methods.

B. Unsatisfactory materials for use in embankments and fills include organic silts and clays, peat and materials of any kind that are determined by Engineer to be too wet or otherwise unsatisfactory.

C. Rock shall be defined as stone or hard shale discovered in excavations in original ledge formation or in pieces having a volume greater than 1/3 cubic yard which cannot be fractured and removed by means other than drilling and blasting or drilling and wedging.

D. Waste materials includes excess usable materials and materials unsuitable for use in the Work.

E. Borrow materials includes all earthfill materials and topsoil obtained from off-site locations. Borrow materials shall be subject to the approval of Engineer and shall be arranged for by Contractor at no additional cost to Owner.

F. Earthfill materials shall be satisfactory cohesive materials and shall have a liquid limit not greater than 50 and a plasticity index between 10 and 25 when tested in accordance with ASTM D4318.

G. Granular material for subgrade stabilization shall be a well-graded mixture of quarry stone or shot rock having a 4 to 6-inch top size with less than 20% passing the No. 200 sieve.

PART 3 - EXECUTION

3.1 EXCAVATION AND FILL

A. Excavation:

1. Perform excavation of every type of material encountered within the limits of the

Work, to the lines and grades indicated on the drawings and as required to complete new construction.

2. Dewatering:

   a. Divert or otherwise prevent surface water from entering excavated areas to the extent practical without causing damage to adjacent property.

   b. Provide and maintain adequate dewatering equipment to remove and dispose of all water entering excavations from any source.

   c. Each excavation shall be kept dry during subgrade preparation and continually thereafter until the Work is complete to the extent that no damage from hydrostatic pressure or other cause will result.

   d. Remove subgrade materials rendered unsatisfactory by excessive wetting and replace with satisfactory fill material as approved by Engineer.

3. Stockpiling of Satisfactory Excavated Materials:

   a. Segregate and stockpile satisfactory materials in sufficient amounts adjacent to the Work to provide for construction of embankments and fills, and for backfilling.

   b. Maintain safe distance between toe of stockpiles and edge of excavation sufficient to prevent cave-ins.

   c. Do not obstruct or prevent access to roads and driveways, utilities, ditches or natural drainage channels.

   d. Stockpile satisfactory materials in other areas or off-site when adjacent structures, easement limitations, or other restrictions prohibit sufficient storage adjacent to the Work.

4. Disposal of Excess Excavated Materials:

   a. Insofar as needed, satisfactory excavated materials shall be used in embankments or fills.

   b. All unused satisfactory excess materials together with unsatisfactory excavated materials and rock shall be disposed of on-site at a location acceptable to the Owner All unused satisfactory excess materials together with unsatisfactory excavated materials and rock shall be removed from the immediate job site and disposed of at a location approved by the Owner’s Representative.

   c. Place excavated rock in the interior portions of disposal area fills so that it will not be exposed to view.

   d. Grade disposal areas to leave them free draining and in a pleasing appearance.

B. Earthfills and Embankments:

1. Construct earthfills and embankments to the lines and grades indicated on the drawings using excess satisfactory materials obtained from job site excavations to the extent available.

2. Provide additional materials from approved borrow sites as necessary to complete the Work.

3. Subgrade Preparation:

a. Excavate or fill as required to construct subgrades to the elevations and grades indicated on the drawings.

b. Remove all unsatisfactory material to the level of firm material, fill with satisfactory material and compact as specified in Part 3.01 B.4.d herein to provide a satisfactory subgrade.

c. Removal of unsatisfactory material below design subgrade elevation and its replacement will be paid on the basis of Contract conditions relative to changes in the Work.

4. Placement and Compaction:

a. Prior to placing fill or embankment, scarify or disc the prepared subgrade to a minimum depth of 6-inches and moisture condition as required to assure adequate bond with fill or embankment.

b. Place fill or embankment materials in approximately horizontal layers not to exceed 8" loose depth.

c. The material placed in each layer shall be moistened or aerated and thoroughly mixed to insure uniform moisture content throughout the layer.

d. Each layer shall then be thoroughly compacted to not less than 95% of maximum density at a moisture content within 2% of optimum as determined by ASTM D698.

e. Do not place frozen materials in embankments or fills and do not place on a frozen surface.

3.2 FIELD QUALITY CONTROL

A. Contractor shall retain the services of a Geotechnical Engineering Firm/Testing Laboratory to inspect and test all subgrades, embankments, and fills to determine conformance with specified density relationships.

1. Testing method may be according to ASTM D2167 or ASTM D2922 as determined by Owner’s Representative.

2. A minimum of 3 compaction tests shall be made for each layer of fill, embankment or excavation at a frequency not to exceed 2,500 square feet of area.

3. All testing shall be reported to the Owner and Engineer in written form.

B. Subgrade Tolerances: Owner’s representative will inspect all subgrades to determine conformance with lines and grades.

3.3 PROTECTION OF THE WORK

A. Maintenance:

1. Protect newly graded and top soiled areas from the elements until grass is established.

2. Repair eroded areas with satisfactory topsoil and re-establish final grades.

B. Correction of Settlement:

1. Under the provisions of the guarantee as provided for in the General Conditions, Contractor is responsible for correcting any settlement and damages caused by same.

2. Contractor shall make necessary repairs within 14 days after notification by Owner.

END OF SECTION 312300

SECTION 312305
LAGOON CLOSURE

PART 1 - GENERAL

1.1 SUMMARY

A. The work of this section consists of the closure of wastewater treatment lagoons including sludge handling, lagoon filling, bringing to site to finish grade and furnishing all labor, materials, tools, and equipment necessary to complete this section.

PART 2 – PRODUCTS – (Not Used)

PART 3 - EXECUTION

3.1 The following steps and procedures shall be taken in the closing of the designated wastewater treatment lagoon:

A. Remove remaining water in existing lagoon by pumping the water, with use of the newly installed pumps in the nearby lift station, into the nearby pressure sewer line. The sludge shall be allowed to adequately dry before mixing with soil.

B. Mix soil with the sludge residual contained within the lagoons, ensuring that the soil/residual mixture is at least one part soil to one part residual, and then till into ground.

C. Demolish the lagoon berms and provide a finished grade no steeper than 3:1.

D. Existing influent and effluent lines to lagoon shall be capped and sealed watertight.

E. Seed and mulch the site as required to establish a stand of vegetation suitable for erosion control.

3.2 Closure of the lagoon is required to be in conformance with Part III of Standard Conditions for NPDES Permits, as issued by the Missouri Department of Natural Resources. Closure of the lagoon will follow the Lagoon Closure Plan attached in this specification.

CAMP CLARK WASTEWATER LAGOON CLOSURE PLAN

NEVADA, MISSOURI

September 2023

Prepared by
Allgeier, Martin and Associates, Inc.
Consulting Engineers

BACKGROUND

Camp Clark National Guard training site is located in Vernon County and has, for a number of years, operated a lagoon wastewater treatment system consisting of two lagoons. This system currently treats an average population equivalent of approximately 1,000. A pressure sanitary sewer line is to be constructed to pump Camp Clark's wastewater to the City of Nevada's sanitary sewer system allowing the lagoon facilities to be taken out of service. There will no longer be any discharged wastewater and both lagoons shall be closed as per this plan.

The approximate surface area of the lagoons is 1.26 acres. The exact construction date of the lagoons is unknown. Wastewater biosolid sources for the lagoons consist mainly of residential and commercial sources from the Camp Clark training site.

In July 2023, Pace Analytical conducted sludge tests on the lagoons, the results of which are included with this closure plan. A survey of the sludge determined that the average sludge depth was 0.77 feet and that the surface area of the sludge was approximately 1.0 acre. Based on this information, the total volume of sludge can be calculated to be 33,510 cubic feet. Using a sludge unit weight of 62 lb/cf, the total weight of the sludge is calculated to be 2,077,625 lbs (1,039 tons). A percent total solids test determined that the lagoons have a 0.19% average total solids by weight. Tests showed that nitrate, nitrite, organic nitrogen, and ammonia nitrogen all came back as "not detected at or above adjusted reporting limit". Therefore, it can be assumed this falls below the allowable PAN limit of 300 lbs/acre. The sludge analysis also tested the concentration of metals in the sludge. The test concluded that arsenic, cadmium, copper, lead, molybdenum, nickel, potassium, selenium, zinc, and mercury were not detected at or above the reporting limit. The results of the metals testing were given on a wet weight basis. All of these concentrations are below the ceiling concentrations given in the MDNR Standard Conditions for NPDES Permits - Part III, which has been included with this closure plan.

All wastewater from the lagoon will be pumped to the City of Nevada's wastewater collection system during the closure of the lagoon. It is anticipated that the added flow from the lagoon will have a minimal impact on the City's wastewater treatment plant, which will be receiving all of Camp Clark's wastewater once the new pressure line is constructed. Water from the lagoon shall be discharged into the sewer system at a rate no greater than 250 gallons per minute. Screening of the lagoon water while being pumped into the proposed sewer will not be necessary.

CLOSURE REQUIREMENTS

The following sections of this Closure Plan are intended to identify the methodology for closing the lagoons. The existing lagoons have been in operation for over 15 years and have not had sludge removal in the last 15 years. Therefore, the lagoons qualify as Class B biosolids and does not require fecal coliform testing. Closure of the lagoons is required to be in conformance with Part III of Standard Conditions for NPDES Permits, as issued by the Missouri Department of Natural Resources. Following the proper draining of water from the lagoons, residuals left in place must be mixed with soil on at least a 1 to 1 ratio, and lagoon berms must be demolished and the site well graded and vegetated so as to avoid ponding of water and to be free of erosion.

During lagoon closure, procedures shall be in-place in case of equipment breakdown during closure operations to promptly repair equipment and to clean any spills caused by the breakdown. All efforts shall also be given to control odor during closure of lagoons.

PLANNED LAGOON CLOSURE

It is proposed that the following activities be undertaken to provide for closure of the lagoon:

1) Remove remaining water in existing lagoon by pumping the water into the existing pressure sewer line utilizing the newly installed pumps in the nearby lift station. The sludge shall be allowed to dry before mixing with soil.

2) Once the soil has dried, mix soil with the sludge residual contained within the lagoons, ensuring that the soil/residual mixture is at least one-part soil to one-part residual, and then till into ground.

3) Demolish the lagoon berms and provide a finished grade no steeper than 3:1.

4) The existing influent and effluent lines shall be capped watertight.

5) Seed and mulch the site as required to establish a stand of vegetation suitable for erosion control.

The closure of the lagoon is a part of a project that disturbs an area of more than one acre and therefore is required to have a Land Disturbance Storm Water Pollution Prevention Plan (SWPPP).

SECTION 312316
EXCAVATION AND BACKFILLING FOR STRUCTURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes all necessary excavation and backfilling for structures including:

1. Excavation as required.
2. Subgrade preparations.
3. Sheeting and Shoring.
4. Filling and backfilling.
5. Field quality control.

B. Related Work:

1. Section 311100 - Site Preparation
2. Section 312300 - Excavation and Fill
3. Division 3 - Concrete

C. References:

1. ASTM International (Formerly American Society for Testing and Materials):

a. ASTM C33 - Standard Specification for Concrete Aggregates.

b. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

c. ASTM D698 - Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5 lb. (2.49 Kg) Rammer and 12-in (305-mm) Drop.

d. ASTM D4253 - Standard Test Methods for Maximum Index Density of Soils Using a Vibratory Table.

e. ASTM D4254 - Standard Test Methods for Minimum Index Density of Soils and Calculation of Relative Density.

1.2 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Submit the following:

1. Granular materials: Sieve Analysis, ASTM C136.

1.3 BASIS OF PAYMENT

A. Measurement: No measurements will be made for work under this Section. Payment will be made on a lump sum basis.

B. Items included: As indicated and required to complete the work.

PART 2 - PRODUCTS

2.1 EXCAVATION CLASSES

A. All materials encountered in excavations shall be unclassified regardless of type, composition, character, and condition thereof. Any rock encountered shall be handled at no additional cost to Owner.

2.2 MATERIALS

A. Earth backfill materials shall be job excavated material that is free of debris, roots, stumps, organic matter and frozen material, and shall be free of stones or rock fragments greater than 4" in any dimension.

B. Unsatisfactory backfill materials include organic silts and clays, peat and materials of any kind that are determined by Owner's Representative to be too wet or otherwise unsatisfactory.

C. Waste materials include excess usable materials and materials unsuitable for use in the Work.

D. Granular backfill material shall be a well-graded mixture of crushed stone or gravel conforming to the gradation requirements of ASTM C33 Size No. 467, No. 5, No. 56 or No. 57. The material shall meet hardness and soundness requirements of ASTM C33.

E. Crushed stone fill material shall be a well-graded mixture of crushed limestone or dolomite conforming to the gradation requirements of ASTM C33 Size No. 6. The material shall meet hardness and soundness requirements for ASTM C33 concrete course aggregate.

F. Granular material for subgrade stabilization shall be a well-graded mixture of quarry stone or shot rock having a 4 to 6-inch top size with less than 20% passing the No. 200 sieve.

PART 3 - EXECUTION

3.1 EXCAVATION

A. Perform excavation to the lines and grades indicated on the drawings and as required for new construction.

B. Excavations shall provide adequate working space and clearances for the Work to be performed therein and for erection and removal of concrete formwork.

C. In no case shall excavation faces be undercut for extended footings.

D. Remove all loose excavated materials and trim to neat lines.

E. Notify the Owner's Representative when excavation is completed to the required grade. Do not proceed with any further Work in the excavated area until approved by the Owner's Representative.

F. Excavation shall be performed using methods and equipment that prevent disturbance of the bearing materials. If bearing materials are disturbed due to excavation operations, they shall be recompacted, removed or stabilized to produce a firm, dense and thoroughly compacted and consolidated subgrade to the satisfaction of the Owner's Representative.

G. Excavate by hand in areas where space and access prevent use of machines.

H. Unauthorized Excavation:

1. Except where otherwise authorized by the Owner's Representative, all satisfactory materials excavated below the required subgrade for cast-in-place concrete structures shall be replaced with concrete of the same quality and placed monolithic with the concrete

above.

2. Excavation of satisfactory materials below the required subgrade for precast concrete structures shall be replaced with crushed stone fill material placed in maximum 6" lifts and compacted to not less than 70% relative density as determined by ASTM D4253 and D4254 using vibratory methods.

I. Subgrade Preparation:

1. Subgrades for concrete structures shall be firm, dense and thoroughly compacted and consolidated; shall be free of mud and muck; and shall be sufficiently stable to remain firm under the feet of workmen.

2. Any soft or otherwise unsatisfactory materials which are found at the design subgrade elevation shall be removed to the level of firm material as directed by the Owner's Representative and replaced with granular material for subgrade stabilization.

3.2 SHEETING AND SHORING

A. Except where banks are cut back on a stable slope, excavations for structures shall be properly and substantially supported as necessary to prevent caving or sliding; to provide protection for workmen and the Work; and to provide protection for existing structures and facilities.

B. Space and arrange sheeting and shoring as required to exclude adjacent material based on the stability of the excavated slopes.

C. Remove sheeting and shoring simultaneously with backfilling operations and backfill voids with granular backfill material.

D. Leave sheeting and shoring in place when required by conditions of supported material and cut off at least 1' below finished surface grade but no lower than 1' above the top of any buried pipes or conduits.

3.3 FILLING AND BACKFILLING

A. Crushed Stone Fill:

1. Where indicated on the drawings, provide a crushed stone fill under all concrete work in contact with grade.

2. Place on properly prepared subgrade in minimum 6" thick loose lift.

3. Compact to not less than 70% relative density as determined by ASTM D4253 and D4254 using vibratory methods.

B. Earth Backfill:

1. Use satisfactory materials as specified in Part 2.01 of this Section and stockpiled from structure excavations.

2. Backfilling around structures shall not proceed until concrete has attained 70% design strength.

3. Backfill adjacent to structures only after a sufficient portion of the structure has been built to resist the imposed load as determined by the Owner's Representative.

4. Remove all debris from excavation as directed by Owner's Representative prior to placement of backfill materials.

5. Place backfill layers on all sides of structures before placing next lift.

6. Place earth backfill materials in horizontal layers not exceeding 8" loose depth.
7. Compact backfill materials around structures to not less than 90% of the maximum dry density and within 3% of the optimum moisture content as determined by ASTM D698.

C. Granular Backfill:

1. Provide granular backfills where indicated on the drawings.
2. Place in maximum 12" thick loose lifts.
3. Compact to not less than 95% relative density as determined by ASTM D4253 and D4254 using vibratory methods.

3.4 GRADING

A. Specified in Section 312200.

3.5 FIELD QUALITY CONTROL

A. Contractor shall test all subgrades, filling and backfilling for structures to determine conformance with specified density relationships.

B. Arrangements, methods, frequency, reporting and payment for testing shall be as specified in Section 312300, Part 3.02 A.

END OF SECTION 312316

SECTION 312333
TRENCHING AND BACKFILLING FOR UTILITIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes trenching and backfilling operations for piped utility systems including:

1. Excavation as required.
2. Preparation of trenches for bedding of pipes and pipe appurtenances.
3. Backfilling of trenches.
4. Field quality control.

B. Related Work:

1. Section 260500 - Basic Electrical Materials and Methods
2. Section 311100 - Site Preparation
3. Section 312300 - Excavation and Fill
4. Division 33 - All Applicable Sections

C. References:

1. ASTM International (Formerly American Society for Testing and Materials):

a. ASTM C33 - Standard Specification for Concrete Aggregates.

b. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

c. ASTM D698 - Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5 lb. (2.49 Kg) Rammer and 12-in (305-mm) Drop.

d. ASTM D4253 - Standard Test Methods for Maximum Index Density of Soils Using a Vibratory Table.

e. ASTM D4254 - Standard Test Methods for Minimum Index Density of Soils and Calculation of Relative Density.

1.2 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Submit the following.

1. Granular embedment and trench stabilization materials: Sieve Analysis, ASTM C136.

1.3 BASIS OF PAYMENT

A. All Work under this Section shall be considered incidental to other related Work and no measurement or direct payment will be made.

PART 2 - PRODUCTS

2.1 EXCAVATION CLASSES

A. All materials encountered in trench excavations shall be unclassified regardless of type, composition, character and condition thereof. Any rock encountered shall be handled at no additional cost to Owner.

2.2 GRANULAR EMBEDMENT MATERIAL

A. Granular Embedment Material for Pipe:

1. Shall be crushed limestone or dolomite.
2. Shall conform to the gradation requirements of ASTM C33 Size No. 67.
3. Maximum embedment material diameter for plastic pipe shall conform to the following:

a. 4-inch and smaller diameter pipe, no greater than 1/2-inch (ASTM C33 Size No. 8).
b. 6 and 8-inch diameter pipe, no greater than for 3/4-inch (ASTM C33 Size No. 7).
c. 10-inch and greater diameter pipe, no greater than 1-inch (ASTM C33 Size No. 67).

B. Granular Embedment Material for Conduits and Cables:

1. Shall be natural sand of siliceous origin.
2. Shall conform to the gradation requirements of ASTM C33 for fine aggregate for concrete.

2.3 EMBEDMENT CLASSES

A. Class B Bedding:

1. Pipe shall be embedded in compacted granular embedment material placed on a flat trench bottom.
2. The granular bedding shall have a minimum thickness of 6" between pipe barrel and bottom of trench excavation and shall extend over the pipe crown a minimum thickness of 6" for the full trench width.
3. Use for all pipelines unless otherwise indicated.

2.4 TRENCH STABILIZATION MATERIAL

A. Trench stabilization material shall be a well-graded mixture of crushed limestone or dolomite conforming to the gradation requirements for coarse aggregate for concrete as defined in ASTM C33, Size #467 (1-1/2" to #4).

2.5 TRENCH BACKFILL MATERIALS

A. Earth backfill material shall be job excavated material containing sufficient fine materials to provide a dense mass free of voids and capable of satisfactory compaction. Masses of moist, stiff clay shall not be used. Gravel, rock or shale particle size shall be limited as follows:

1. Shall not exceed 4" in greatest dimension within 12" of pipe and upper 18" of trench.
2. In all other areas, the maximum dimension shall not exceed 2/3 the lift thickness to be compacted.

B. Granular backfill material shall be a well-graded mixture of crushed stone or dolomite

conforming to the gradation requirements for concrete coarse aggregate as defined in ASTM C33, Size 467 (1-1/2" to #4).

PART 3 - EXECUTION

3.1 TRENCH EXCAVATION

A. Perform trench excavation to the lines and grades indicated on the drawings and as required to complete new construction.

1. In the event organic chemicals are encountered during trenching operations, Contractor shall cease construction activities and contact Engineer for further instructions.

B. Equipment and Methods:

1. Types of equipment and methods will be at Contractor's option subject to the following restrictions.

a. The use of mechanical equipment will not be permitted in locations where its operation would cause damage to trees, structures, utilities or other facilities above or below ground. Use hand excavating methods in all such locations.

b. Equipment and methods shall be subject to approval of jurisdictional agency where stability or usefulness of existing facility may be impaired.

2. All trench excavation shall be open cut from the surface except where tunneling is indicated on the drawings or is specified.

3. Material excavated from trenches shall be placed a sufficient distance from trench walls to reduce the potential for cave-ins.

4. Maximum length of open trench ahead or behind laying operations shall be 100'.

5. No trench shall be left open overnight.

C. Trench Side Walls:

1. Shall be vertical below a horizontal plane 12" above the top of pipe.

2. Shall be vertical or sloped as required for stability and safety above a horizontal plane 12" above the top of pipe.

3. Slope sidewalls to comply with the requirements of any authorities having jurisdiction.

4. Sheet and brace where sloping is not possible because of space restrictions or stability of materials excavated. Remove sheeting and shoring simultaneously with backfilling operations and backfill voids with granular backfill material. Leave sheeting and shoring in place when required by conditions of supported material and cut off at least 1' below finished grade but no lower than 1' above the top of any buried pipes.

5. Maintain sides and slopes in safe condition until completion of backfilling.

D. Trench Depth:

1. Excavate trenches to a sufficient depth to provide the minimum bedding requirements for the pipe being installed.

2. Do not exceed the indicated or required depth where satisfactory bearing materials exist.

3. Increase trench depths when necessary for the following:

a. To remove unsatisfactory bearing materials encountered at the indicated or required subgrade elevation.

b. To obtain clearance beneath existing utilities, drains, structures, or other obstructions encountered at the indicated or required subgrade elevation.

c. To install pipe on vertical curves.

4. Where pipe grades or elevations are not definitely fixed by the drawings, excavate trenches to a depth sufficient to provide a minimum depth of backfill cover of 42" over the top of pipes.

E. Trench Bottom:

1. Protect and maintain in a stable condition when satisfactory bearing materials are encountered at indicated or required subgrade elevations.

2. Remove rock fragments and loose materials disturbed during excavation or that slough from trench sidewalls.

3. When groundwater is present in the trench, de-water as required to maintain the stability of in-situ or imported materials.

a. Maintain water level below pipe bedding and trench subgrade elevation to provide a stable trench bottom.

b. Maintain control of water in the trench before, during and after pipe installation, and until embedment is installed and sufficient backfill has been placed to prevent floatation of the pipe.

4. Restore all over-excavation to proper subgrade with trench stabilization material.

a. Place trench stabilization material in maximum 12" thick loose lifts and compact to not less than 70% relative density as determined by ASTM D4253 and D4254 using vibratory methods.

b. Removal of unsatisfactory materials encountered at indicated or required subgrade elevations and its replacement shall be paid on the basis of contract conditions relative to changes in the Work.

c. Unauthorized excavation of satisfactory material below indicated or required subgrade elevations shall be corrected by and at the expense of the Contractor.

F. Trench Width:

1. Trenches shall be excavated to a width which will provide adequate working space and sidewall clearances for proper pipe installation, jointing and placement of embedment material.

2. Trench width from six (6) inches below the bottom of the pipe to six (6) inches above the pipe joint shall be held to 24" minimum, or 1.4 times the pipe O.D., plus 12 inches. Trench width above these levels may be wider to accommodate shoring, bracing, and shields, but shall be kept within practical limits and shall be subject to the Engineer's approval.

G. Trenching in Fill Areas:

1. Perform trenching in fill areas only after compacted fill has reached an elevation of not less than 1' above the top of the pipe.

H. Test Pits:

1. Excavate test pits sufficiently in advance of trenching to enable adequate planning of construction procedure.
2. Excavate test pits in locations where:
    a. Unstable material is suspected that may require special protective measures.
    b. Interference or conflict with other utilities and/or structures could affect pipe alignment or grade.

3.2 GRANULAR EMBEDMENT

A. Placement and Compaction:

1. Granular embedment material shall be placed on a stable, flat trench bottom.
2. Spread and level embedment material at proper grade to provide a uniform and continuous support beneath the pipe barrel throughout its length.
3. Form depression under each joint such that no part of bell or coupling is in contact with the trench when pipe is placed in position.
4. Additional layers of embedment material shall be placed and compacted uniformly and simultaneously on each side of the pipe to prevent lateral displacement.
5. Work in and compact embedment material under pipe haunches by rodding or shovel slicing to insure complete contact with the pipe bottom, and to fill voids below the pipe.

3.3 TRENCH BACKFILL

A. Placement and Compaction:

1. Backfill trenches promptly after completion of pipe embedment.
2. Limit depth of backfill over concrete reaction blocking to 8" until concrete has reached at least 70% of design strength.
3. Compacted Earth Backfill: Required for full depth of trench above the embedment in established lawn areas.
    a. Place in horizontal layers not exceeding 8" loose depth.
    b. Compact upper 12" to at least 95% of maximum density and within 2% of optimum moisture content as determined by ASTM D698.
    c. Compact remainder of depth to at least 90% of maximum density and within 3% of optimum moisture content as determined by ASTM D698.
4. Compacted Granular Backfill: Required for full depth of trench above the embedment beneath pavements, surfacings, shoulders, driveways, curbs, gutters, or other surface construction or structures.
    a. Place in horizontal layers not exceeding 12" loose depth.
    b. Compact upper 12" to at least 75% of relative density as determined by ASTM D4253 and D4254 using vibratory methods.
    c. Compact remainder of trench to at least 70% relative density as determined by ASTM

D4253 and D4254 using vibratory methods.

5. Uncompacted Backfill:

   a. Compaction of trench backfill above pipe embedment in locations other than those specified will not be required except to the extent necessary to prevent future settlement.

   b. Uncompacted backfill material above embedments shall be placed by methods which will not impose excessive concentrated or unbalanced loads, shock, or impact on installed pipe, and which will not result in displacement of the pipe.

3.4 GRADING

A. Specified in Section 312200.

3.5 FIELD QUALITY CONTROL

A. Contractor shall test all trench stabilization, embedments, trench checks and trench backfill to determine conformance with specified density relationships.

B. Arrangements, methods, frequency, reporting and payment for testing shall be as specified in Section 312300, Part 3.02 A.

END OF SECTION 312333

SECTION 320117
PAVEMENT REMOVAL AND REPLACEMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section covers removal and replacement of bituminous pavement, concrete pavement, curbs, gutters, walks and other surface improvements for utility construction.

B. Related Work:

1. Section 312333 - Trenching and Backfilling for Utilities

C. References:

1. American Society for Testing and Materials (ASTM)

a. ASTM D1190 - Specification for Concrete Joint Sealer, Hot-Poured Elastic Type.

b. ASTM D1751 - Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

2. Missouri Department of Transportation Standard Specifications for Highway Construction (MODOT):

a. Division 300 - Bases and Aggregate Surfaces.

b. Division 400 - Flexible Pavements

c. Division 500 - Rigid Pavements

d. Division 1000 - Materials Details

1.2 SUBMITTALS

A. Submit as specified in Section 013300.

B. Provide certification that materials conform to the applicable requirements of the specified standards.

1.3 BASIS OF PAYMENT

A. Removal of bituminous pavement, concrete pavement, curbs, gutters, walks and other surface improvements shall be considered incidental to other related Work and no measurement or direct payment will be made.

B. Plant Mix Bituminous Pavement Replacement:

1. Measurement: Complete product in place per lineal foot.

2. Items included: As indicated and required for a complete installation including, but not limited to, subgrade preparation, aggregate base course, prime coat and bituminous surface course including all materials, hauling, spreading, compaction and finishing.

C. Portland Cement Concrete Pavement Replacement:

1. Measurement: Complete product in place per lineal foot.

2. Items included: As indicated and required for a complete installation including, but not limited to, subgrade preparation, aggregate base course and Portland cement concrete pavement including all materials, hauling, placement and surface finishing.

D. Concrete Curb and Gutter Replacement:

1. Measurement: Complete product in place per lump sum.
2. Items included: As indicated and required for a complete installation including, but not limited to, subgrade preparation, aggregate base course and concrete work including all materials, equipment, placement, surface finishing, backfilling and grading.

E. Concrete Walk Replacement:

1. Measurement: Complete product in place per square yard.
2. Items included: As indicated and required for a complete installation including, but not limited to, subgrade preparation, aggregate base course and concrete work including all materials, equipment, placement, surface finishing, backfilling and grading.

F. Replacement of other surface improvements not specifically listed above shall be considered incidental to other related Work and no measurement or direct payment will be made.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aggregate for base shall be Type 1 Aggregate as defined in MODOT Section 1007.1.

B. Bituminous material for surface preparation shall conform to the following:

1. Tack coat for bituminous or concrete surfaces shall be Emulsified Asphalt Grade SS or CSS conforming to MODOT Sections 407 and 1015.7.
2. Prime coat for aggregate surfaces shall be Liquid Asphalt Grade RC-800 conforming to MODOT Sections 408 and 1015.2.
3. Blotter material shall be natural sand of siliceous origin with 100% passing the No. 4 sieve and not more than 2% passing the No. 200 sieve, and moisture content less than 3% by weight.

C. Plant Mix Bituminous Pavement shall conform to MODOT Section 401.

1. Bituminous material shall be Asphalt Cement Grade AC-10 or AC-20 conforming to MODOT Section 1015.5.
2. Aggregate and mineral filler materials shall conform with MODOT Section 1002. Gradation of combined aggregates shall conform with gradation BP-2.

D. Concrete for pavement, curbs, gutters and walks shall conform to ASTM C94, 4000 psi, high early strength. Accelerator (high early strength) admixture shall comply with ASTM C494, Type C specifications. Reinforcement shall conform to ASTM A615, Grade 60, deformed.

1. Expansion Joint Filler shall be bituminous type, 1/2" thick, conforming to ASTM D1751.
2. Hot-Poured Joint Sealing Compound shall conform to ASTM D1190.

PART 3 - EXECUTION

3.1 PERMITS TO OPEN SURFACES

A. Obtain permit to open surfaces from the authority having jurisdiction, as required.

B. Post bond and pay any fees as required.

C. Obtain prior to cutting pavement or surface.

3.2 CUTTING AND REMOVAL

A. Removal of pavement, curbs, gutters, walks and other surface construction shall be performed prior to trench excavation.

B. Dimensions of the area removed shall be no larger than necessary to provide adequate working space for proper installation of pipe and appurtenances.

1. Remove to the extent necessary to provide a shoulder not less than 12" in width at any point between the cut edge of the pavement and the top of the trench wall.

2. Extend area to existing pavement joints or edge of pavement where cut would result in the remaining pavement strip being less than 3' in width.

C. Cutting shall be started with a concrete saw in such a manner to provide straight cuts with vertical edges to the depth required to establish break line.

1. Make cuts to and between straight or accurately marked curved lines parallel to the centerline of the trench, unless otherwise directed by the Engineer

2. Pavement crossed diagonally shall be squared by saw cutting at right angles to the paved area.

D. Where trench crosses drives, walks, curbs, or other surface construction, remove and replace same between existing joints or between saw cuts as specified for pavement.

E. Where trench parallels concrete walks and the location is partially under the walk, remove and replace the entire walk.

F. All concrete and bituminous materials removed shall be disposed as waste material.

3.3 REPLACEMENT

A. General:

1. Unless otherwise indicated on the drawings, replace pavements, curbs, gutters, walks and other surface improvements with like materials to those removed.

2. Complete within 60 days of utility construction, weather permitting.

3. Restore to equal or better condition than existed before start of Work and to satisfaction of the authority having jurisdiction.

B. Aggregate Base Course:

1. Conform to the construction requirements of MODOT Section 304.

2. Place aggregate base course on properly prepared subgrade.

3. Place to a compacted thickness equal to existing base course, but not less than 6".

C. Tack or Prime Coat:

1. Conform to the equipment and construction requirements of MODOT Section 407 and 408 as applicable.

2. Apply tack coat to existing bituminous or concrete surfaces at a rate between 0.02 and 0.10 gallons per square yard as directed by Engineer.

3. Apply prime coat to existing aggregate surfaces at a rate between 0.2 and 0.5 gallons per square yard as directed by Engineer.

4. If asphalt material is not completely cured within the maximum recommended curing time,

spread sufficient sand over the surface to blot up excess asphalt. Sweep loose sand from primed to tacked surface prior to placing bituminous paving course.

D. Flexible Pavement Replacement:

1. Conform to the equipment and construction requirements of MODOT Sections 401 or 409 as applicable.
2. Place plant mix bituminous pavement to a finished thickness equal to existing bituminous surface, but not less than 2".
3. Place double seal coat consisting of two applications of bituminous material and cover aggregate where required on the drawings.
4. After placement, the pavement shall be free from ragged edges and shall have a finished surface conforming to the established contours of the original pavement and existing adjacent surfaces.

E. Rigid Pavement Replacement:

1. Conform to the equipment and construction requirements of MODOT Section 502.
2. Place to a finished thickness equal to existing concrete pavement, but not less than 6".
3. Both transverse ends of all new Portland cement concrete repairs shall be sawed 2" deep by 3/8" wide, and sealed with joint sealing compound.

F. Curb and Gutter Replacement:

1. Construct curb and gutter to the cross-section and gutter cross-slope of that removed.
2. Place bituminous preformed expansion joints, 1/2" thick and precut to exact cross-section of the curb and gutter at the radii of all changes in direction and at intervals not greater than 50'.
3. Provide contraction joints at intervals not exceeding 6'.
    a. Contraction joints shall consist of a groove at least 1" deep, and 1/8" to 1/2" in width, sawed in the green concrete, or
    b. A plane of weakness formed by inserting a removable metal template.
4. Fill all expansion and contraction joints with joint sealing compound, finished slightly concave so as not to overflow the joint.
5. Round all exposed edges of curb and gutter to a 1/2" radius with a suitable edging tool.
6. Exposed surfaces shall be finished smooth and even with a steel trowel and given a light broom finish.

G. Concrete Walk Replacement:

1. Construct walks to the width of that removed, and a thickness not less than 6" in driveways and 4" in all other areas.
2. Provide bituminous preformed expansion joints, 1/2" thick, where walks abut a structure, at changes in direction, and at intervals not more than 40'.
3. Walks shall be divided by grooves into equal length sections of 4' to 6' in length. Grooves shall be 1/8" to 1/4" in width and extend to 1/4 the depth of the walk.
4. Round edges to a 1/4" radius with a suitable edging tool.
5. Walks shall be floated smooth and even and given a light broom finish at right angles to their length.

3.4 FIELD QUALITY CONTROL

A. Flexible Pavements:

1. Contractor shall sample the completed pavement at no additional cost to the Owner to verify that the compacted layer is constructed to specified thickness.
2. Samples shall be obtained by drilling 4" diameter cores at locations designated by the Engineer.
3. Samples shall be taken the full depth of the compacted layer and shall consist of an undisturbed portion of the compacted mixture.
4. Restore surface from which samples are taken within 48 hours using an approved commercial mixture.

B. Rigid Pavements

1. Contractor shall furnish test equipment, test cylinder molds, and trained personnel to make the required concrete test cylinders and deliver the test cylinders to the testing laboratory.
2. Concrete sampling for cylinder making shall be done conforming to ASTM C172. Samples shall be taken at random as directed and at the point of truck discharge.
3. Prepare test cylinders conforming to ASTM C31, with not less than one set of cylinders (four cylinders) from each day's placement for each 100 cubic yards or fraction thereof.
4. Laboratory Testing:

    a. Contractor shall employ and pay to retain the services of an engineering testing laboratory to perform required laboratory testing.

    b. Laboratory shall cure and test concrete cylinders conforming to ASTM C192 and C39, testing two cylinders at 7-days of age and two cylinders at 28-days of age.

    c. Low-strength concrete is defined as either:

        1) Concrete whose average, of any sets of three consecutive 28-day strength tests, is below the required 28-day strength.

        2) Concrete whose individual 28-day strength tests (average of two cylinders) is more than 500 psi below the required 28-day strength.

    d. Potentially low-strength concrete is defined as concrete whose 7-day strength tests (average of two cylinders) is less than 70% of the specified 28-day strength.

5. Should test results indicate low strength concrete, contractor shall take immediate corrective action, as approved by Engineer.
6. Remove and replace with acceptable concrete when the quality and location of the low-strength concrete is such that Engineer considers the strength or durability of the pavement is impaired and so orders.

END OF SECTION 320117

SECTION 321540
AGGREGATE SURFACING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes material and construction requirements for aggregate surfacing.

B. Related Work:

1. Section 312200 - Grading

C. References:

1. ASTM International (Formerly American Society for Testing and Materials):

a. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

b. ASTM D698 - Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5 lb. (2.49 Kg) Rammer and 12-in (305-mm) Drop.

c. ASTM D4253 - Standard Test Methods for Maximum Index Density of Soils Using a Vibratory Table.

d. ASTM D4254 - Standard Test Methods for Minimum Index Density of Soils and Calculation of Relative Density.

2. Missouri Department of Transportation Standard Specifications for Highway Construction (MoDOT):

a. Division 300 - Bases and Aggregate Surfaces.

b. Division 1000 - Materials Details

1.2 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Granular Materials.

1. Sieve Analysis, ASTM C136.

2. Representative sample of proposed material for inspection and acceptance by Owner's representative.

1.3 BASIS OF PAYMENT

A. Measurement: Complete product in place per lump sum.

B. Items Included: As indicated and required for a complete installation including, but not limited to, excavation, subgrade preparation, aggregate surfacing, installation and compaction.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aggregate Surfacing: Type 1 Aggregate for Base as defined in MoDOT Section 1007.2.

PART 3 - EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

A. Construct areas to receive crushed stone surfacing to the lines, grades, cross sections, and dimensions indicated on the drawings.

B. Subgrade Preparation:

1. Subgrades shall be firm, dense and thoroughly compacted and consolidated; shall be free of mud and muck; and shall be sufficiently stable to remain firm under traffic loads.

2. Any soft or otherwise unsatisfactory materials which are found shall be removed to the level of firm material as directed by the Owner's Representative and replaced with granular material for subgrade stabilization as specified in Section 312300.

3. Compact subgrade to not less than 95% of maximum density at a moisture content within 2% of optimum as determined by ASTM D698.

4. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Owner's Representative without additional compensation.

5. Subgrades to receive aggregate surfacing shall have a maximum deviation of not more than 1-inch in any 10-feet when tested with a 10-foot straight edge applied parallel with and perpendicular to the centerline of subgrade areas.

C. Crushed Stone Surfacing Placement:

1. Where areas are shown on the drawings to receive crushed stone surfacing, they shall be excavated to the proper depth on which a course of crushed stone shall be placed. The crushed stone shall be placed and compacted to a finished thickness of six (6) inches.

2. Compact aggregate surfacing to not less than 75% relative density as determined by ASTM D4253 and D4254.

3.2 FIELD QUALITY CONTROL

A. Subgrade Tolerances:

1. Owner's Representative will inspect all subgrades to determine conformance with lines, grades, cross sections, and dimensions indicated on the drawings.

END OF SECTION 321540

SECTION 323113
CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 SUMMARY

A. The work in this section consists of furnishing all labor, materials, tools, equipment and incidentals necessary to construct the chain link fencing and gates as shown on the plans and described herein.

1.2 BASIS OF PAYMENT

A. Measurement: Complete product in place per lump sum.

B. Items Included: As indicated and required for a complete installation.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Material and Coating: Posts, gate frames, braces, rails, stretcher bars, and truss rods shall be of steel; reinforcing wires shall be of high carbon steel; and gate hinges, post caps, barbed wire, and supporting arms, stretcher bar bands, and other parts shall be of steel, malleable iron, ductile iron or equal except that ties and clips may be of aluminum. All steel and iron parts shall be zinc coated after fabrication, using zinc grade "E" in accordance with Federal Specification QQ-Z-351. The weight of the zinc coating per square foot of actual surface area shall average not less than 1.2 ounces and no individual specimen shall show less than 1.0 ounces.

1. Lift station perimeter fencing shall consist of galvanized steel chain link fence with a fabric height of six (6) feet and an overall height of seven (7) feet from the bottom of the fabric to the top barbed wire. Fence shall have a top rail, bottom tension wire, and three strands of barbed wire mounted on 45-degree extension arms. Posts shall be set in concrete. Fence fabric shall be 9-gauge zinc-coated steel.

B. Gates: Gates shall be swing, complete with latches, stops, keepers, and hinges with provision for three strands of barbed wire above the fabric.

1. Gate Frames: Constructed of tubular members (round or square) welded at all corners or assembled with fittings. On steel, welds shall be painted with aluminum base or zinc base paint. Where corner fittings are used, gates shall have truss rods of 3/8-inch nominal diameter to prevent sag or twist. Gate leafs shall have vertical intermediate bracing as required, spaced so that no members are more than eight feet apart. End members of the gate frames shall be extended one foot above the top horizontal member to which three strands of barbed wire, uniformly spaced, shall be attached by use of bands, clips, or hook bolts. Gate filler shall be of the same fabric as specified for fence and shall be attached securely to gate frame at intervals of 15 inches.

2. Hinges: Adequate strength for gate, and with large bearing surfaces for clamping in position. The hinges shall not twist or turn under the action of the gate. The gates shall be capable of being opened and closed easily by one person.

3. Latches, Stops and Keepers: Provided for all gates. Latches shall have a plunger-bar arranged to engage the center stop, except that for single gates of openings

less than 10 feet wide, a forked latch may be provided. Latches shall be arranged for locking. Center stops shall consist of a device arranged to be set in concrete and to engage a plunger bar of the latch of double gates. No stop is required for single gates. Keepers shall consist of a mechanical device for securing the free end of the gate when in the full open position.

C. Posts: Shall be of the lengths specified and shall be tubular, except that line posts may be H-beam.

1. Post Braces: Provided for each gate corner, pull, and end post, and shall consist of a round tubular brace extending to each adjacent line post at approximately mid height of the fabric, and a truss consisting of a rod not less than 3/8-inch in nominal diameter from the line post back to the gate, corner, pull, or end post, with a turnbuckle or other equivalent provision for adjustment.

2. Post Tops: Combination tops with barbed-wire supporting arms. The post tops shall fit over the outside of posts and shall exclude moisture from tubular posts.

D. Barbed Wire Supporting Arms: Shall be at an angle of approximately 45° or vertical as specified, and shall be fitted with clips or other means for attaching three strands of barbed wire. With 15-inch arms the top wire shall be approximately 12-inches horizontally from the fence line and the other wires spaced uniformly between the top of the fence fabric and the outside strand. Barbed wire arm shall be of sufficient strength to withstand a weight of 200 pounds applied at the outer strand of barbed wire.

E. Top Rails: Shall be round (tubular), shall be in lengths not less than 18 feet, and shall be fitted with couplings for connecting the lengths into a continuous run. The couplings shall be not less than six inches long, with .070 minimum wall thickness, and shall allow for expansion and contraction of the rail. Open seam outside sleeves shall be permitted only with a minimum wall thickness of .100 inches. Suitable ties or clips shall be provided in sufficient number for attaching the fabric securely to the top rail at intervals not exceeding two feet. Means shall be provided for attaching the top rail to each gate, corner, pull, and end post.

F. Stretcher Bars: Shall not be less than 3/16 by 3/4-inch nor less than two inches shorter than the full height of the fabric with which they are to be used. The stretcher bars shall be arranged for attaching the fabric to all terminal posts by threading through the fabric, by bands, or by other positive mechanical means. One stretcher bar shall be provided for each gate and end post, and two for each corner and pull post.

G. Ties, Clips, Bands: Ties or clips of adequate strength shall be provided in sufficient number for attaching the fabric to all line posts at intervals not exceeding 15 inches. Bands or clips of adequate strength shall be provided in sufficient number for attaching the fabric and stretcher bars to all terminal posts at intervals not exceeding 15 inches. Tension bands and brace bands shall be formed from flat or beveled steel and shall have a minimum thickness of .155 inch after galvanizing and a minimum width of 7/8 of an inch.

H. Barbed Wire: Barbed wire shall consist of two strands of 12-1/2 gauge wire with 14-gauge 4 point barbs spaced approximately 5 inches apart. All wire shall be zinc coated with a minimum coating of 0.80 ounces per square foot of surface area on 12-1/2 gauge wire and 0.60 ounces per square foot of surface area on 14-gauge wire.

I. Posts, gate frames, rails, and braces shall conform to the dimensions and weights as follows:

Use and Section	Outside Diameter or Dimensions Nominal	Weight Per Foot Nominal
End, corner and pull posts (tubular) for fabric heights: 6 feet and less: Round Sch-40	2.375	3.65
Square	2.00	3.60
Gate posts for nominal width of gate, single, or one leaf of double: 6 feet and less: Round Sch-40	2.875	5.79
Square	2.50	5.70
Gate width 13 feet and less: Round Sch-40	4.00	9.10
Square	3.00	9.10
Gates: exterior frames for fabric heights: 6 feet and less, and gate leafs 8 feet and less: Round Sch-40	1.660	2.27
Square	1.50	1.90
Gate leafs over 8 feet width: Round Sch-40	1.90	2.72
Square	2.00	2.10
Internal gate bracing: Round Sch-40	1.660	2.27
Square	1.50	1.90
Rails and post braces (tubular): Round Sch-40	1.660	2.27
Intermediate posts for fabric heights: 6 feet and less: Tubular (round) Sch-40	1.90	2.72
H-Section	.875 x 1.625 x .113	2.70

PART 3 - EXECUTION

3.1 INSTALLATION

A. Line posts for site fence shall be spaced at intervals not to exceed 10 feet average when measured from center to center between terminal posts. In general in determining the post spacing, measurement will be made parallel to the slope of the natural ground, and all posts shall be placed in a vertical position except where designated otherwise by the Resident Project Representative. All posts shall be set in holes of diameter and depth as follows:

Type of Post	Fabric Height	Hole Diameter at Top	Hole Depth	Post Embedment
Line	6'-12'	9"	38"	36"
Terminal	6'-12'	12"	38"	36"

B. After the post has been set and plumbed, the hole shall be filled with fill concrete. The exposed surface of the concrete shall be crowned to shed water.

C. Where solid rock is encountered without an overburden of soil, line posts shall be set a minimum depth of 12 inches, and end, corner, gate and pull posts a minimum of 18 inches into the solid rock. The hole shall have a minimum width one inch greater than the largest

dimension of the post section to be set.

D. After the post is set and plumbed, the hole shall be filled with grout consisting of one part Portland cement and three parts clean, well-graded sand. Other grouting materials may be used if approved or specified by the Owner. The grout shall be thoroughly worked into the hole so as to leave no voids. The grout shall be crowned to carry water from the post.

E. Where solid rock is covered by an overburden of soil or loose rock, the posts shall be set to the full depth unless the penetration into solid rock reaches the minimum depths specified above, in which case, the depth of penetration may be terminated. Concrete footings shall be constructed from the solid rock to the top of the ground. Grouting will be required on the portion of the post in solid rock.

F. End, corner, gate and pull posts shall be braced to the nearest post with a horizontal galvanized pipe brace used as a compression member, and a galvanized 3/8-inch steel truss rod and trust tightener used as a tension member. All members in direction of fence line of 30° or more shall be considered as corners. Pull posts shall be used at all abrupt changes in grade.

G. Barbed wire support arms shall be placed on the side of the fence as designated by the Owner or his representative.

H. The fabric shall be stretched taut approximately two (2) inches above the ground, and securely fastened to the posts. The fabric shall be cut and each span shall be attached independently at all terminal posts. Fastening to terminal posts shall be with stretcher bars and fabric bands spaced at 15-inch intervals maximum. Fastening to line post shall be with tie wire, metal bands, or other approved methods, attached at maximum 15-inch intervals. The top edge of the fabric shall be fastened to the top rail with wire ties at intervals not exceeding 24 inches. The bottom edge of fabric shall be fastened to the bottom tension wire with wire ties at intervals not exceeding two feet.

I. Rolls of wire fabric shall be joined by weaving a single strand into the ends of the rolls to form a continuous mesh.

END OF SECTION 323113

SECTION 329200
TURF AND GRASSES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section covers establishment of new lawns, and restoration of existing lawns and other areas disturbed during construction including:

1. Preparation of subgrade to receive topsoil.
2. Spreading topsoil.
3. Seed bed preparation.
4. Seed protection on areas subject to erosion.
5. Maintenance of seeded areas until acceptance.

B. Related Work:

1. Section 311100 - Site Preparation
2. Section 312200 - Grading

C. References:

1. Missouri Department of Transportation Standard Specifications for Highway Construction (MoDOT):

a. Section 801 - Fertilizing
b. Section 802 - Mulching
c. Section 805 - Seeding

1.2 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Suppliers or vendors guaranteed statement of analysis stating botanical and common name, percentage by weight, and percentages of purity, germination and weed seed for each grass species.

C. Suppliers or vendors certified analysis for fertilizer substantiating compliance with specified requirements.

D. Copy of vendor’s invoice for all seed, fertilizer and mulch showing quantity by weight purchased for the project to assure compliance with specified application rates.

E. Copy of analysis of soil tests supporting specified fertilizer and agricultural lime application rates.

1.3 DELIVERY, STORAGE AND HANDLING

A. Deliver grass seed in original containers labeled according to the U.S. Department of Agriculture Federal Seed Act showing analysis of seed mixture, percentage of pure seed, year of production, net weight, and date and location of packaging.

B. Deliver fertilizer in waterproof bags showing weight, chemical analysis and name of

manufacturer.

C. Protect materials from deterioration during delivery and while stored at site.

1.4 QUALITY ASSURANCE

A. Unless otherwise specified herein, all materials and construction requirements shall conform to MoDOT Sections 801 through 803 and 805.

1.5 BASIS OF PAYMENT

A. Measurement: Complete product in place per lump sum.

B. Items Included: As indicated and required for a complete installation.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Topsoil: Topsoil is defined as selectively excavated surface soil that is representative of local soils that produce heavy growths of crops, grass or other vegetation. Satisfactory topsoil is reasonably free of underlying subsoil, clay lumps, weeds, litter, brush, matted roots, toxic substances or any material harmful to plant growth or which would hinder grading, planting, or maintenance operations. Topsoil shall not contain more than 5% by volume of stones or other such objects larger than 1/2" in any dimension for lawn seeded areas and 1" in any dimension in other seeded areas.

B. Lime: Agricultural lime with not less than 90% passing the No. 8 sieve and containing not less than 65% calcium carbonate equivalent.

C. Fertilizer: Formula 12-12-12 or equivalent analysis commercial grade, uniform in composition, free flowing suitable for application, and conforming to Missouri State Fertilizer Laws.

D. Grass Seed:

1. Provide fresh, clean seed from current year's crop complying with tolerances for purity and germination established under the U.S. Department of Agriculture Federal Seed Act and Missouri State Seed Law.

2. Seed that is wet, moldy or that has otherwise been damaged in transit or storage will not be acceptable.

3. Type 1 Seed Mixture: Unless otherwise specified or indicated, use the following blend of grass seed for establishment or restoration of forage grass on areas that are disturbed during construction operations.

Kind of Seed	Purity %	Germination %	Mixture %
Kentucky 31 Tall Fescue	97	85	80
Annual Rye	90	85	20

E. Mulch:

1. Type 1 Mulch (Vegetative):

a. Cereal straw from oats, rye, wheat or barley,

b. Free of prohibited weed seed as stated in the Missouri Seed Law, and

c. Relatively free of all other noxious and undesirable seed.

2. Type 3 Mulch (Hydraulic Mulch):

a. Virgin wood cellulose fiber mulch with tackifier. Mulch shall be produced by either the ground or cooked fiber process, shall not be water soluble, and have the following properties:

1) Cellulose Fiber Mulch - 82% ± 3% by weight

2) Organic Tackifier - 3% ± 1% by weight

3) Moisture Content - 12% ± 3% by weight

b. All components of the hydro-mulch shall be pre-packaged by the Manufacturer to assure compliance with the above values. No chemical additives with the exception of fertilizer, lime and biostimulant materials are to be added to the product.

PART 3 - EXECUTION

3.1 SEQUENCING

A. Seeding shall progress as rapidly as portions of the site become available, working within seasonal limitations.

B. Seasonal Limitations:

1. Unless otherwise authorized, perform seeding only during the following seasons:

a. February 1 to April 20

b. September 1 to October 30

2. Unless otherwise authorized, sod shall not be placed during a drought nor during the period from April 20 to September 1.

3. Seeding shall not be performed when the ground is frozen, covered with snow or otherwise in a non-tillable condition.

3.2 SEED BED PREPARATION

A. Top Soiling: Specified in Section 312200 - Grading.

B. Remove and dispose of rocks over 1-inches in any dimension, sticks, roots, rubbish and other extraneous matter which may interfere with tilling, seeding or later maintenance.

C. Thoroughly loosen and pulverize topsoil to a depth of at least 4 inches.

D. Application rate of agricultural lime and fertilizer shall be based on soil analysis performed by qualified professional engaged by Contractor. Incorporate lime and fertilizer into the soil to a depth of at least 2 inches by discing, harrowing or raking.

E. Fine grade and hand rake to a smooth even surface with loose, uniformly fine texture void of any ridges or depressions.

F. Limit preparation to areas which will be seeded promptly after preparation.

G. Restore prepared areas to specified condition if eroded or otherwise disturbed after fine grading and prior to seeding.

3.3 SEEDING

A. Distribute seed evenly over the entire area to be seeded by sowing equal quantity in two directions at right angles to each other.

B. Application Rates: Apply seed mixture at the rate of 8 pounds per 1,000 square feet (350 pounds per acre).

C. Application Methods:

1. Dry Seeding: Perform mechanically with approved equipment designed for even distribution of dry seed. Equipment may be either hand operated, such as knapsack seeder, or be tractor-drawn, such as seed drill, except that tractor-drawn equipment will not be permitted on lawn areas. Cover seed with soil to an average depth of 1/4 inch by raking or other approved method. Roll lightly with a lawn-type roller.

2. Hydraulic Seeding: Mix seed with water and constantly agitate to maintain uniform mixture. Do not add seed to water more than 4 hours before application. Equipment shall have a built-in agitation system and operating capacity sufficient to agitate, suspend and homogeneously mix a slurry containing not less than 50 pounds of organic mulching amendment plus fertilizer, chemical additives and solids for each 100 gallons of water.

a. Do not leave hydro-seeding slurry compounds in the hydro-seeding machine for more than two (2) hours prior to application to prevent possible seed destruction. If slurry compounds are left in the machine for more than two hours, add 50% more of specified seed mix to any slurry mixture not applied within two hours after mixing. Add 75% more of the specified seed mix to any slurry mixture which has not been applied four hours after mixing. All mixtures more than six (6) hours old must be disposed off-site at Contractor’s expense.

3.4 MULCHING

A. Apply mulch on all seeded areas within 24 hours following seeding operation. Mulch type as indicated on the drawings.

B. Application Rates:

1. Type 1 Mulch (Vegetative): Apply at the rate of 2 tons per acre. Immediately after anchoring the mulch, water the seeded area in one watering, in sufficient amount to penetrate the seed bed to a minimum depth of 2 inches.

2. Type 3 Mulch (Hydraulic Mulch): Apply in accordance with the manufacturer’s recommendations at a rate of 1500 to 2000 pounds per acre.

3.5 MAINTENANCE

A. Maintain seeded areas until acceptable stand of grass is established.

B. Perform watering, fertilizing, weeding, mowing, trimming and other maintenance as required to establish a flourishing stand of grass free of weeds, bare spots and surface irregularities.

C. Repair erosion damage, reseed and replace displaced mulch as necessary until final acceptance.

3.6 ACCEPTANCE OF SEEDED AREAS

A. When seeding work is completed, including maintenance, Engineer and Owner will, upon request, make an inspection to determine acceptability.

B. Seeding work may be inspected for acceptance in parts agreeable to Engineer and Owner, provided work offered for inspection is complete, including maintenance.

C. Repair rejected work and continue specified maintenance until reinspected by Engineer and Owner and found to be acceptable.

D. Seeding work will be acceptable provided, specified requirements have been complied with and a healthy, uniform, close stand of grass is established, free of weeds, bare spots and surface irregularities.

END OF SECTION 329200

SECTION 330130.81
SEWER FLOW DIVERSION AND CONTROL

PART 1 – GENERAL

1.1 SUMMARY

A. Work of this section consists of furnishing all labor, materials, tools, equipment, and incidentals necessary to control sanitary sewer flow during evaluation, rehabilitation, and emergency repairs. Limited sewage flow is acceptable during internal inspection of sanitary sewers. Complete stoppage or bypassing of flow shall be required for sewer line and manhole rehabilitation work.

1. Pumping and Bypassing: When pumping and bypassing is required, the Contractor shall provide pumps, conduits, and other equipment to divert and control sewage flows around manholes and/or sewer lines in which work is to be performed. Flow diversion and control shall be done in accordance with this specification.

1.2 SUBMITTALS

A. Submit under provisions of Section 013300. Include the following:

1. Flow diversion plan.

1.3 BASIS OF PAYMENT

A. Work under this Section shall be considered incidental to other related Work and no measurement or direct payment will be made.

PART 2 - PRODUCTS

2.1 EQUIPMENT AND MATERIALS

A. Provide temporary pumps, conduits, and other equipment to bypass sewage flow. Engines shall be equipped with mufflers and/or shall be enclosed so that noise level does not exceed 50 decibels or 10 decibels above ambient noise levels when measured at the building closest to noise source.

B. Pumps and bypass lines shall be of adequate size and capacity to handle flows that may be encountered during peak flow periods or from precipitation. The bypass system shall be constructed using materials and workmanship that shall prevent leakage during pumping operations.

C. Maintain sufficient equipment and materials on site to ensure continuous and successful operation of bypass and dewatering systems. Keep standby pumps fueled and ready for operation at all times. Maintain on site a sufficient quantity of valves, tees, elbows, connections, tools, sewer plugs, piping, and all other parts or system hardware to ensure immediate repair or modification of any part of system, as necessary.

D. Provide piping, joints, and accessories that are designed to withstand at least twice the maximum system pressure, or 50 psi, whichever is greater.

PART 3 - EXECUTION

3.1 IMPLEMENTATION

A. Notification: The Contractor shall notify and provide reasonable access to all properties with the

least amount of inconvenience to the Owner or the public. All available safety measures must be maintained.

B. Discharge of Bypassed Flows: Where flows are bypassed, bypassed flows shall be discharged into Owner's sanitary sewer system at locations approved by the Owner. No bypassed flows shall be discharged to ground surface, surface waters, storm drains, ditches, or gutters. Bypassing which results in groundwater contamination, surface water contamination or presents a threat to public health shall not be permitted.

C. Spills and Overflows: In the event sewage accidentally drains into a drainage system or street, the Contractor shall immediately stop the overflow, notify the Owner, and take all necessary actions to clean up and disinfect the spillage to the satisfaction of the Owner. If sewage is spilled on private property, the contaminated area shall be washed down, cleaned up and disinfected to the satisfaction of the Owner. Any and all overflow of sewage shall be immediately reported to the Owner.

D. Plugging or Blocking: A plug shall be inserted in the line upstream of the sewer line being worked. Plugs shall be designed so that all or a portion of upstream flow can be released. After completing work on the section of sewer line or manhole in question, flow through that section shall be restored to normal.

E. Sewer Backups: The Contractor shall indemnify and hold the Owner harmless for any sewer backup claims filed against the Owner, within the scope of the project, and during the warranty period, if caused by Contractor's action or lack thereof.

F. Incidental Work: All work required by this Contract and necessary to complete the project which is not specifically listed in the items of work indicated are considered incidental to the project. Cost for this incidental work shall be included in the work for which it is a part.

G. Clean Up and Restoration: The Contractor shall keep premises free from accumulations of waste materials, rubbish, and other debris generated by Contractor's operations. Upon completion of bypass pumping, bypass piping shall be drained into existing sanitary sewers prior to piping being disassembled. Contractor is to save and/or restore, as nearly as possible, to original condition all damaged fences, bushes, trees, lawns and other improvements.

END OF SECTION 330130.81

SECTION 330516
UTILITY STRUCTURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section covers precast reinforced concrete structures including:

1. Manholes.
2. Vaults.
3. Related appurtenances such as adjustment rings, frames, covers and steps.

B. Related Work:

1. Section 312316 - Excavation and Backfilling for Structures
2. Section 312333 - Trenching and Backfilling for Utilities
3. Section 330518 - Pressure Pipe and Fittings
4. Section 333113 - Sanitary Sewer Systems
5. Section 333416 - Pressure Pipe Installation

C. References:

1. ASTM International (Formerly American Society for Testing and Materials):

a. ASTM A48 - Standard Specification for Gray Iron Castings.
b. ASTM A615 - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
c. ASTM C94 - Standard Specification for Ready-Mixed Concrete.
d. ASTM C478 - Standard Specification for Precast Reinforced Concrete Manhole Sections.
e. ASTM C890 - Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures.
f. ASTM C923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals.

2. American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges:

a. Section 3.7.6-HS Loading.

3. Federal Specifications (FS):

a. FS SS-S-00210A - Sealing Compound, Preformed Plastic for Expansion Joints and Pipe Joints, Type 1, Rope Form.

1.2 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Material Certifications: Submit certification that products conform to the applicable requirements of the specified standards.

C. Shop Drawings: Submit detailed drawings and data covering precast concrete sections and related appurtenances.

1.3 BASIS OF PAYMENT

A. Measurement: Complete product in place per lump sum.

B. Items Included: As indicated and required for a complete installation.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cast-in-place concrete shall conform to ASTM C94, 4,000 psi compressive strength. Reinforcement shall conform to ASTM A615, Grade 60, deformed.

B. Precast manhole sections shall conform to ASTM C478 and ASTM C890 except as modified herein. Manufacture in accordance with applicable requirements of Part 3.1 herein.

C. Joint sealant shall conform to AASHTO Specification M-198, shall be suitable for application in vertical and horizontal joints and shall be K.T. Snyder “Ram-Nek”, Hamilton-Kent “Kent-Seal No. 2”, or approved equal. Cross sectional area as recommended by manhole manufacturer.

D. Resilient manhole/pipe connectors designed to make a watertight seal between the precast manhole and sewer pipe shall conform to ASTM C923 and shall be A-LOK, as manufactured by A-LOK Products, Inc. or approved equal.

E. Damp-proofing shall conform to Koppers Specifications for Coal Tar Bitumastic Super Service Black or approved alternate.

F. External joint wrap material shall be “Cretex Wrap” by Cretex Specialty Products, “Mac Wrap” by MarMac Construction Products, Gator Wrap by Infi-Shield, or approved equal.

G. Castings shall conform to ASTM A48 Class 35B or better.

1. Specific pattern as noted on the drawings.

2. Frames and covers shall have machined horizontal bearing surfaces to provide even seating.

3. Coat with coal-tar pitch varnish applied at the foundry.

4. Stamped inscription consistent with intended use.

H Steps shall be aluminum reinforced low density polyethylene or steel reinforced copolymer polypropylene.

1. MSU, Mississauga Limited “Model 360”, M.A. Industries Type “PS2-PF”, or approved equal.

I. Non-shrink grout shall be SEALTIGHT 588 Grout, as produced by W.R. Meadows, or approved equal.

PART 3 - EXECUTION

3.1 MANHOLES - FABRICATION AND MANUFACTURING

A. Precast reinforced concrete manholes shall be manufactured to requirements of ASTM C478, latest revision and shall be of the type, size, and configuration shown on the drawings. Manhole tops shall be of the eccentric type. The minimum allowable wall thickness shall be determined by the manhole depth as below:

Depth	Minimum Wall Thickness
0 to 16 feet	1/12 of internal diameter
16 feet or greater	1/12 of internal diameter + 1"

Minimum internal diameter of any manhole section shall be 4 feet. Dampproofing shall be factory applied on all exterior surfaces. Dampproofing system shall be Koppers Coal Tar Bitumastic Super Service Black or an approved alternate, applied to manufacturer's specifications. Two coats, each of minimum 14 mils dry thickness, shall be applied. A 75-volt maximum wet sponge detector shall be employed to check for holidays in the dried finish film.

B. Base sections with integral inverts shall be provided with circular openings and continuous circular, resilient pipe connectors cast into the wall.

C. Base sections for use with cast-in-place inverts shall be provided with horseshoe-shaped box-outs for connecting piping to be grouted in, or with circular openings with continuous, circular, resilient pipe connectors cast into the riser wall.

1. Use base sections with horseshoe-shaped box-outs only where manholes are required to be set over an existing sewer line.
2. Cast-in-place inverts shall be used for manholes over 16-feet depth and shall extend at least 8-inches beyond outside of manhole wall.

D. Manhole tops shall be eccentric type cone sections or flat slab type as required by the drawings.

1. Flat slab tops shall be designed and reinforced to withstand AASHTO HS20 highway loading.

E. Adjustment rings shall have a thickness not less than 4-inches nor more than 12-inches and shall be fiber reinforced.

F. Provide lifting notches on the inside faces of precast sections to facilitate handling.

1. Depth of lifting notches shall not exceed 1/2 the wall thickness.
2. Holes extending through the wall will not be acceptable.

G. Orient steps on side opposite the outlet pipe unless otherwise directed.

3.2 CONSTRUCTION

A. Precast units shall be set into a reinforced concrete base constructed of 3,500 min. psi concrete, 4-inch maximum slump, and #4 rebars at 12-inch on center each way. Bottom section shall set into the base a minimum of twelve (12) inches. Base shall extend not less than six (6) inches from outside manhole wall. The joints in the precast concrete manhole shall be set in a pre-molded mastic material or a rubber gasket to produce an absolutely watertight joint under full hydrostatic head conditions. Additionally, all joints shall have a minimum 12” wide, external rubber joint wrap installed per the manufacturer’s instructions.

B. Precast manhole bases will be allowed on manholes where practical. Inverts shall be constructed within precast bases in the field as described by this specification. Precast manhole bases with integral inverts shall not be allowed except at the Engineer's discretion after review of detailed shop drawings submitted by the Contractor.

C. Precast riser sections shall be set plumb and oriented access opening to match the detailed drawings designations.

D. Join all precast concrete sections with a double layer of joint sealant to obtain a pliable

watertight joint. Provide 12-inch-wide external joint wrap on all below grade precast concrete section joints. Install joint wrap in accordance with manufacturer's recommendations.

E. Inlet and outlet pipes shall extend through the walls of the structures a sufficient distance beyond the outside surface to allow for connections and shall extend six (6) inches beyond the inside surface of the wall. The new manhole shall be cleaned of silt, debris, or other foreign matter prior to acceptance.

F. Openings for sewer pipe in manhole sections shall be formed at the factory, with cast-in-place manhole pipe connector gaskets.

G. Invert channels shall be smooth and semi-circular in shape conforming to the inside of the adjacent pipe line sections with change in flow direction made by a smooth curve of as large a radius as the manhole size will permit, and changes in the size and grade of the channels being made gradually and evenly. Manhole floor shall rise a minimum of 1 inch per foot from side of channel to wall.

H. All lifting holes shall be thoroughly wetted and completely filled with non-shrinking grout to form a watertight seal.

I. All castings, frames, and covers shall be set true to line and to correct elevation upon a mastic gasket. All bolt down manhole covers shall have the frames attached to the manholes with anchor bolts as shown on the detailed drawings. Frames and covers shall have true common bearing surfaces, such that the covers will seat firmly without rocking or shifting.

J. Manholes shall not leak more than 1.14 gallons per day per vertical foot of manhole under a full hydrostatic head.

K. The drop pipe in manhole drops shall be constructed using standard pipe sections and fittings so as to enter at the bottom of the manhole and also continue the incoming line in a straight line to enter the manhole at a higher elevation, all as shown on the detailed drawings.

3.3 NEW MANHOLE OVER AN EXISTING LINE

A. Manholes to be located over an existing sewer line will be built so that all of the manhole inverts will be smooth and continuous after the sewer pipe is broken open. All pipe to manhole connections shall be made with connector gaskets as manufactured by A-Lok Products, Inc. or an approved equal.

3.4 CONNECTIONS TO EXISTING MANHOLES

A. Existing manholes used for connecting new sewer lines to the existing sewerage system shall have the invert chipped out and grouted back as required to facilitate the uninterrupted sewage flow from the new connection. This operation will be directed by the Engineer. All pipe to existing manhole connections shall be made with Inserta-Lok connectors, as manufactured by A-Lok Products, Inc. or an approved equal.

3.5 PIPE ANCHORS AND THRUST BLOCKS

A. Conform to the dimensions and details shown in the drawings.

B. Place pipe anchors and thrust blocks against unyielding, undisturbed earth or rock.

1. Install pipe anchors at locations indicated on the drawings
2. Install thrust blocks at tees, elbows, bends, and dead ends as required.

3.6 FIELD QUALITY CONTROL

A. Inspection and Rejection:

1. The quality of material, the process of manufacture and the finished precast sections shall be subject to inspection and approval by the Engineer.
2. Precast sections shall be subject to rejection for failure to conform to any of the specified requirements. In addition, individual sections may be rejected because of any of the following:

    a. Fractures or cracks passing through the manhole wall.
    b. Defects that indicate imperfect proportioning, mixing and molding.
    c. Surface defects indicating honeycombed or open texture.
    d. Damaged or cracked ends where such damage would prevent making a satisfactory joint.
    e. Any continuous crack having a surface width of 0.01-inch or more and extending for a length of 4-inches or more.

B. Hydrostatic Testing of Concrete Manholes: The Contractor will be required to make either hydrostatic or vacuum infiltration/exfiltration tests of all manholes to demonstrate that the manholes are free of leaks. Satisfactory test results must be obtained before the manhole will be accepted.

1. Where the top of the sewer is below water level, a one-half inch (½") galvanized pipe nipple is to be cast into each manhole wall and capped on the inside. The pipe nipple is to be located at the top of the inside bore of sewer pipe. All tests are to be conducted in the following manner:

    a. Test plugs are to be placed in the end of each sewer pipe on the upstream side of both manholes and inflated to a maximum pressure of 16 psig. Plugs are to be thoroughly blocked to prevent them from blowing out. The sewer pipe and manhole shall be filled with water to a level four and one-half feet (4-½') above the groundwater level or seven (7') feet above the pipe invert, whichever is higher. Ten minutes shall then be allowed for absorption, after which the water level shall be brought back to the test elevation.
    b. The specified head shall be maintained on the manhole for a period of eight (8) hours. Sufficient water shall be added to maintain this level. All water added shall be metered to within one-tenth of a gallon and recorded. The maximum allowable leakage shall be as specified herein. If zero (0) water loss is recorded after two (2) hours of testing, the testing may be considered complete, and the test section accepted.
    c. The Contractor shall provide all water, pumping facilities, and metering facilities necessary to perform the tests. After each test, all test water is to be pumped out by the Contractor.

C. Vacuum Testing of Concrete Manholes: Vacuum testing, performed in accordance with this specification, shall be allowed as a substitute method for hydrostatic testing of manholes. The vacuum test equipment shall be approved by the Engineer prior to commencing manhole testing.

1. The vacuum "test head" assembly shall be placed inside the frame of the manhole cover, in order to include in the test, the seal between the frame and the manhole cone section, slab, or adjusting rings.

2. Plugs shall be placed at least eight (8) inches inside all pipes entering the manhole. Location of plugs shall be such that when inflated, they are past the gasket seal or joint of

the manhole and sewer pipe. All plugs shall be braced sufficiently to prevent the plug or pipe from becoming dislodged and drawn into the manhole.

3. A vacuum of at least 10½ inches mercury shall be drawn on the manhole. The valve on the vacuum line to the manhole shall be closed, and the vacuum line disconnected. The vacuum within the manhole shall then be adjusted to 10 inches of mercury by opening the vacuum line valve.

4. A liquid-filled pressure gauge having a face of 3½ inches and reading from zero to 30 inches of mercury shall be utilized.

5. The time for the vacuum reading to drop from 10 inches of mercury to 9 inches of mercury must be equal to or less than the following values in order for the manhole to be considered as passing the vacuum test.

Manhole Depth	Time (minutes)
10 feet or less	2.0
10.1 feet to 15 feet	2.5
15.1 feet to 25 feet	3.0

6. If vacuum drops less than one (1) inch mercury within the test time, the manhole is considered acceptable and passes the test. If manhole fails and leaks, the contractor shall make the needed repairs and test again until satisfactory results are obtained. Test may be done before backfilling but shall be repeated after backfilling.

    a. All safety procedures, placing of plugs, and bracing, labor, and other work required for testing will be the responsibility of the contractor.

    b. The Contractor shall supply all required test plugs, vacuum plate, and vacuum pump.

END OF SECTION 330516

SECTION 330517
GRAVITY SEWER PIPE AND FITTINGS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section covers gravity sewer pipe, fittings and specials for collection and transmission of wastewater including:

1. Gravity sanitary sewers.

B. Related Work:

1. Section 312333 - Trenching and Backfilling for Utilities
2. Section 330516 - Utility Structures
3. Section 333113 - Sanitary Sewer Systems

C. References

1. American Society for Testing and Materials (ASTM)

a. ASTM D1784 - Rigid Polyvinyl Chloride Compounds and Chlorinated Polyvinyl Chloride Compounds.

b. ASTM D3034 - Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings (4" through 15").

c. ASTM D3212 - Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.

d. ASTM F477 - Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

e. ASTM F679 - Specification for Polyvinyl Chloride (PVC) Sewer Pipe and Fittings (18" through 27").

1.2 SUBMITTALS

A. Submit as specified in SECTION 013300.

B. Furnish certification that products conform to the applicable requirements of the specified standards.

C. Furnish data and drawings showing the following:

1. Details of joints.
2. Gasket material.
3. Pipe length.
4. Details of fittings and couplings.

PART 2 - PRODUCTS

2.1 PIPE REQUIREMENTS

A. Gravity sewer pipe and fittings shall be polyvinyl chloride (PVC).

B. All pipe and fittings shall be marked conforming to the applicable standard under which the pipe is manufactured.

C. All elastomeric gaskets and seals shall be synthetic rubber.

2.2 POLYVINYL CHLORIDE PIPE (PVC) AND FITTINGS

A. All PVC sewer pipe and fittings shall meet the requirements of ASTM D1784 cell classification 12454-B for PVC compounds.

B. PVC sewer pipe and fittings, 8" through 15", shall conform with ASTM D3034, SDR-35 when buried less than 10 feet and shall conform with ASTM D3034, SDR-26 when buried 10 feet or greater.

C. PVC sewer pipe and fittings, 18" or larger, shall conform with ASTM F679, PS-115.

D. Joint systems for PVC sewer pipe and fittings shall be integral bell and spigot type with factory installed, locked in-place, compression type gaskets conforming to ASTM D3212. Gaskets shall be synthetic rubber and shall meet the low head requirements of ASTM F477.

2.3 COUPLINGS

A. Shall be Fernco “Flexible Couplings”, Mission “Eastern Standard Band-Seal Couplings”, or approval equal.

B. Provide couplings with stainless steel shear ring.

2.4 WATERSTOPS

A. Unless otherwise indicated, pipe to wall penetrations shall be Fernco “Concrete Manhole Adaptors”, NDS Products “DFW/HPI Concrete Manhole Adapters”, or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION AND TESTING

A. Specified in Section 333113.

END OF SECTION 330517

SECTION 330518
PRESSURE PIPE AND FITTINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes pressure pipe, fittings, specials and appurtenances for piped utility systems.

B. Related Work:

1. Section 312333 - Trenching and Backfilling for Utilities
2. Section 333416 - Pressure Pipe Installation

C. References

1. American National Standards Institute (ANSI):

   a. ANSI A21.10 - Cast Iron and Ductile Iron Fittings, 2 thru 48 In., Water

   b. ANSI A21.5 - Polyethylene Encasement/Gray & Ductile Cast Iron Pipe

   c. ANSI B16.1 - Cast-Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250 and 800

2. ASTM International (Formerly American Society for Testing and Materials):

   a. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength

   b. ASTM A536 - Standard Specification for Ductile Iron Castings

   c. ASTM A674 - Standard Practice for Polyethylene Encasement for Ductile Iron Pipe for Water or Other Liquids

   d. ASTM D1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds

   e. ASTM D1785 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120

   f. ASTM D2241 - Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR-Series)

   g. ASTM D2464 - Standard Specification for Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80

   h. ASTM D2466 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40

   i. ASTM D2467 - Standard Specification for Socket-Type Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80

   j. ASTM D2564 - Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings

   k. ASTM D2672 - Standard Specification for Joints for IPS PVC Pipe Using Solvent Cements

   l. ASTM D3139 - Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals

m. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

n. ASTM F656 - Standard Specification for Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings

3. American Water Works Association (AWWA):

a. AWWA C104 - Cement-Mortar Lining for Cast-Iron and Ductile-Iron Pipe and Fittings for Water

b. AWWA C110 - Ductile-Iron and Gray-Iron Fittings, 3 Inches through 48 Inches, for Water and Other Liquids

c. AWWA C111 - Rubber-Gasket Joints for Cast-Iron and Ductile-Iron Pressure Pipe and Fittings

d. AWWA C115 - Flanged Ductile-Iron Pipe with Threaded Flanges

e. AWWA C151 - Ductile-Iron Pipe Centrifugally Cast, for Water or Other Liquids

f. AWWA C153 - Ductile-Iron Compact Fittings

g. AWWA C800 - Underground Service Line Valves and Fittings

h. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 Inch through 60 Inch

1.2 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Furnish certification that products conform to the applicable requirements of the specified standards.

C. Furnish data and drawings showing the following:

1. Details of joints.

2. Gasket material.

3. Pipe length.

4. Details of fittings and couplings.

5. Details of protective linings and coatings.

PART 2 - PRODUCTS

2.1 PIPE REQUIREMENTS

A. Each pipe material specified herein is given an alphanumeric abbreviation which is shown on the drawings to denote the applicable specified material for the given size and service.

B. All pipe and fittings shall be marked conforming to the applicable standard under which the pipe is manufactured.

2.2 POLYVINYL CHLORIDE PLASTIC PRESSURE PIPE AND FITTINGS (PVC)

A. All PVC pressure pipe and fittings shall meet the requirements of ASTM D1784 cell classification 12454-B for PVC compounds.

B. All pipe and fittings shall bear the National Sanitation Foundation (NSF) Seal of Approval.

C. Ductile iron O.D. PVC pressure pipe in sizes 4 inch through 60 inch shall conform to AWWA C900, DR18.

1. Joint systems shall be integral bell, gasketed type meeting the requirements of ASTM D3139.

2. Elastomeric gaskets shall be synthetic rubber meeting the requirements of ASTM F477.

3. Fittings shall be mechanical joint ductile iron as specified in PART 2.3 and shall have a pressure rating not less than the pipe.

2.3 DUCTILE IRON PIPE AND FITTINGS (DIP)

A. Ductile Iron Pipe: Unless otherwise specified or shown on the drawings, ductile iron pipe shall be pressure class 350 and shall conform to the latest revision of ANSI A21.51 - (AWWA C151) Standard for Ductile Iron Pipe Centrifugally Cast in Metal Molds or Sand Lined Molds, for Water or Other Liquids. The pipe shall be standard asphaltic varnish coated on the outside.

1. Pipe shall be lined with Protecto 401 Ceramic Epoxy. The material shall be an amine cured novalac epoxy containing at least 20% by volume of ceramic quartz pigment. Any request for substitution must be accompanied by a successful history of lining pipe and fittings for sewer service. All ductile pipe and fittings shall be delivered to the application facility without asphalt, cement lining, or any other lining on the interior surface. Because removal of old linings may not be possible, the intent of this specification is that the entire interior of the ductile iron pipe and fittings shall not have been lined with any substance prior to the application of the specified lining material, and no coating shall have been applied to the first six inches of the exterior of the spigot ends. Test results and certification shall be provided by the pipe manufacturers that verify the lining used on the pipe for this project is capable of meeting the following requirements:

a. A permeability rating of 0.00 when tested according to Method A of ASTM D-96-66, Procedure A with a test duration of 30 days.

b. The following test must be run on coupons from factory-lined ductile iron pipe:

i. ASTM B-117 Salt Spray (scribed panel) – Results to equal 0.0 undercutting after two years.

ii. ASTM G-95 Cathodic Disbondment 1.5 volts @ 77°F. Results to equal no more than 0.5 mm undercutting after 30 days.

iii. Immersion Testing rated using ASTM D-714-87. 20% Sulfuric Acid – no effect after two years. 25% Sodium Hydroxide – no effect after two years. 160°F Distilled Water – no effect after two years. 120°F Tap Water (Scribed panel)–0.0 undercutting after two years with no effect.

c. An abrasion resistance of no more than 4 mils (.10 mm) loss after one million cycles – European Standard EN 598: 1994 section 7.8 Abrasion resistance.

2. Application: The lining shall be applied by a competent firm with a successful history of applying linings to the interior of ductile iron pipe and fittings.

a. Surface Preparation: Prior to abrasive blasting, the entire area to receive the protective compound shall be inspected for oil, grease, etc. Any areas where oil, grease, or any substance that can be removed by solvent is present shall be solvent cleaned using the guidelines outlined in DIPRA-1 Solvent Cleaning. After the

surface has been made free of grease, oil, or other substances, all areas to receive the protective compounds shall be abrasive blasted using compressed air nozzles with sand or grit abrasive media. The entire surface to be lined shall be struck with the blast media so that all rust, loose oxides, etc. are removed from the surface. Only slight stains and tightly adhering annealing oxide may be left on the surface. Any area where rust reappears before lining must be reblasted.

b. After the surface preparation and within 8 hours of surface preparation, the interior of the pipe shall receive 40 mils nominal dry film thickness of Protecto 401. No lining shall take place when the substrate or ambient temperature is below 40 degrees Fahrenheit. The surface also must be dry and dust free. If flange pipe or fittings are included in the project, the lining shall not be used on the face of the flange.

c. Coating of Bell Sockets and Spigot Ends: Due to the tolerances involved, the gasket area and spigot end up to 6 inches back from the end of the spigot end must be coated with 6 mils nominal, 10 mils maximum Protecto Joint Compound. The Joint Compound shall be applied by brush to ensure coverage. Care should be taken that the Joint Compound is smooth without excess buildup in the gasket seat or on the spigot ends. Coating of the gasket seat and spigot ends shall be done after the application of the lining.

d. Number of Coats: The number of coats of lining material applied shall be as recommended by the lining manufacturer. However, in no case shall this material be applied above the dry thickness per coat recommended by the lining manufacturer in printed literature. The maximum or minimum time between coats shall be that time recommended by the lining material manufacturer. No material shall be used for lining which is not indefinitely recoatable with itself without roughening of the surface.

e. Touch-up and Repair: Protecto Joint Compound shall be used for touchup or repair in accordance with manufacturer's recommendations.

3. All ductile iron pipe and fitting linings shall be checked for thickness using a magnetic film thickness gauge. The thickness testing shall be done using the method outlined in SSPC-PA-2 Film Thickness Rating.

4. The interior lining of all pipe barrels and fittings shall be tested for pinholes with a non-destructive 2,500-volt test. Any defects found shall be repaired prior to shipment.

5. Each pipe joint and fitting shall be marked with the date of application of the lining system along with its numerical sequence of application on that date and records maintained by the applicator of his work.

6. The pipe or fitting manufacturer must supply a certificate attesting to the fact that the applicator met the requirements of this specification, and that the material used was as specified, and that the material was applied as required by the specifications.

7. Protecto 401 lined pipe and fittings must be handled only from the outside of the pipe and fittings. No forks, chains, straps, hooks, etc. shall be placed inside the pipe and fittings for lifting, positioning, or laying.

8. On any occasion when the lined pipe is cut or damaged in the field, the lining shall be touched up or repaired in accordance with the manufacturer's recommendations to ensure all pipe surfaces are properly coated and protected.

9. All ductile iron pipe immersed or submerged in sludge or wastewater shall be coated in

accordance with specification Section 099100 – PAINTING.

B. Fittings: The fittings to be used with ductile iron pipe may be either gray iron or ductile iron and shall conform to the requirements of ANSI/AWWA C110 or C153, latest revision. All fittings shall be coated and lined in the same manner as the pipe. All fittings shall have a pressure rating not less than that for specified pipe. Mechanical joint and push-on joint gaskets shall meet all applicable requirements of ANSI 21.11-85 (AWWA C111).

C. Joints: Unless specifically noted otherwise, joints for ductile iron pipe that are to be buried shall be either a push-on type or a mechanical joint. Unless noted otherwise, joints for pipe used inside buildings or structures shall be either flanged or a lock coupling for grooved-end pipe.

1. Push-on Type Joint: The push-on type joints consisting of a single neoprene gasket that are acceptable are “Tyton” as manufactured and licensed by the U.S. Pipe and Foundry Company or “Fastite” as manufactured and licensed by the American Cast Iron Pipe Company. All required joint materials, including the neoprene gasket and the lubricant, shall be furnished with the pipe.

2. Mechanical Joint: Mechanical joint ends shall comply with the requirements of ANSI A21.11 (AWWA C111). All required joint materials, including neoprene gasket, gland, bolts, and nuts, shall be included with the pipe.

3. Flanged Joint: The flanged joint shall be integrally cast and shall conform to the requirements of ANSI Specification B16.1 for Class 125. Screw-on flanges will be acceptable, but any required threading of pipe barrel shall be done by the factory in conformance with AWWA C115 utilizing Class 53 pipe. Flanges shall be ductile iron. The pipe barrel and flange shall not be field assembled. The flanges shall be furnished with factory-purchased full face gaskets 1/8-inch thick of rubber per ANSI/AWWA C111/A21.11.

4. Restrained Joint: The restrained joint for pipes 14-inch diameter and larger shall be a boltless connection type that utilizes a square, alloy steel, welded-on retainer ring in conjunction with a split ring and socket groove to provide the means of restraint. The joint shall be disassembleable using a closure-spreader mechanism integral to the split ring. The split ring, retainer ring, and all parts associated with the closure-spreader mechanism shall be corrosion-resistant, high strength, low alloy (HSLA) steel conforming to ANSI/AWWA C111/A21.11. All required joint materials including neoprene gasket and lubricant shall be supplied with the pipe. Restrained joint shall be “Lok-Ring Joint Pipe” as manufactured by American Ductile Iron Pipe. As an alternate to the preceding, the restrained joint may be TR-FLEX or TR-FLEX GRIPPER, as manufactured by U.S. Pipe and Foundry Co., SUPER-LOCK, as manufactured by Clow Water System Company, or approved equal.

D. Mechanical Joint Restraints:

1. Restraint devices shall consist of multiple gripping wedges incorporated into a follower gland meeting applicable requirements of ANSI/AWWA C110/A21.10.

2. Devices shall have a working pressure rating equal to or greater than the joining pipe and/or fitting.

3. Gland body, wedges, and wedge actuating components cast from grade 65-45-12 ductile iron conforming to ASTM A536. Ductile iron gripping wedges heat treated within a range of 370 to 470 BHN.

4. Devices installed with conventional tools and installation procedures per AWWA C600, while retaining full mechanical joint deflection during assembly as well as allowing joint deflection after assembly.

5. Casing bodies and wedge assemblies provided with fusion bonded epoxy coating, NFS 61 certified.

6. Acceptable Manufacturers:

   a. Ductile Iron Pipe: EBAA Iron Series 1100 MEGALUG® Restraint.

   b. PVC Pipe: EBAA Iron Series 2000PV MEGALUG® Restraint.

   c. Approved equal.

E. Polyethylene Encasement:

1. Seamless, conforming with ANSI/AWWA C105/A21.5 and ASTM A674; 8-mil LLDPE or 4-mil LHDPE.

2. Provide polyethylene encasement on all buried pipe and fittings.

2.4 SEWAGE COMBINATION AIR VALVE

A. Body Material: Shall be conical shaped, constructed of either 316 stainless steel or fiberglass reinforced nylon.

B. All internal parts shall be of 316 stainless steel or non-metallic poly materials. The hinge of the seal on the orifice shall be made of EPDM rubber.

C. Hardware: All hardware shall be of 316 stainless steel bolts and nuts.

D. Combination air valves shall be designed for a minimum working pressure of 145 psi and shall be tested at a pressure of 230 psi.

E. Valve shall be either NPT or ANSI standard flange, as noted on the drawings.

PART 3 - EXECUTION

3.1 INSTALLATION AND TESTING

A. Specified in related Sections.

3.2 SEWAGE COMBINATION AIR VALVE

A. Operation: Combination air valves shall be specially designed to operate with wastewater and other solids-bearing liquids.

B. Valves shall provide separation of the liquid from sealing mechanism.

C. The rolling resilient seal shall provide smooth positive opening, closing, and leak-free sealing over the fluctuation of pressure differentials.

D. Valves must discharge air at high velocity during filling of the system and admit air during its drainage.

E. Valves shall be designed to prevent premature closing.

F. The float system shall have a spring connection to the sealing mechanism to allow for vertical and horizontal movement of the float during the pumping cycle.

G. Accessories:

1. Each valve shall be provided with backflush attachments.

H. Combination air valves shall be A.R.I. USA, Inc. model D-26 or approved equal, as noted on the drawings.

END OF SECTION 330518

SECTION 330526
UTILITY MARKERS AND LOCATORS

PART I - GENERAL

1.1 SUMMARY

A. This Section covers materials and installation requirements for markers and locators for piped utility systems including:

1. Tracer Wire and Related Appurtenances
2. Marker Posts

B. Related Work:

1. Section 312333 - Trenching and Backfilling for Utilities
2. Section 333416 - Pressure Pipe Installation

C. References:

1. American Public Works Association (APWA):

a. Uniform Color Code

2. American National Standards Institute (ANSI):

a. ANSI Standard Z535.1 – Marking Physical Hazards Safety Color Code

3. ASTM International (Formerly American Society for Testing and Materials):

a. ASTM D1238 – Standard Specification for Test Methods for Melt Flow Rates of Thermoplastics by Extrusion Plastometer

b. ASTM D1248 - Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable

1.2 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Product Data: Submit manufacturer’s catalog data and application installation instructions for each product proposed for use.

1.3 QUALITY ASSURANCE

A. Products and execution shall be in compliance with all applicable codes and standards including those listed above.

B. Installation shall be in compliance with Manufacturer’s recommendations and installation instructions.

1.4 BASIS OF PAYMENT

A. Measurement: Complete product in place per lump sum.

B. Items Included: As indicated and required for a complete installation.

PART 2 - PRODUCTS

2.1 GENERAL

A. All utility markers and locators provided under this Section shall be color coded in accordance with APWA Uniform Color Code and bear a continuous permanently printed inscription describing the specific utility.

2.2 TRACER WIRE AND RELATED APPURTENANCES

A. Tracer Wire:

1. Open Trench: Tracer wire shall be #12 AWG high strength copper clad steel conductor, insulated with a 30 mil HDPE insulated jacket, rated for direct burial use at 30 volts with 21% conductivity, and have a minimum 450 lb. break strength. Equal to Copperhead® High Strength Tracer Wire, Part #1230-HS.

2. Directional Drilling/Boring: Tracer wire shall be #12 AWG extra high strength copper clad steel conductor, insulated with 45 mil HDPE insulated jacket, rated for direct burial use at 30 volts with 21% conductivity, and have a minimum 1,150 lb. break strength. Equal to Copperhead® SoloShot™ Extra High Strength Tracer Wire, Part #1245-EHS.

3. Insulation shall be high density, high molecular weight, polyethylene (HDPE) intended for direct bury and meet or exceed all applicable ASTM specifications including ASTM D1248 and ASTM D1238. Color coded in accordance with APWA Uniform Color Code.

B. Tracer Wire Connectors:

1. Tracer wire connectors shall be lockable type specifically manufactured for use in underground tracer wire installations.

2 Connectors shall be dielectric silicon filled to seal out moisture and prevent corrosion.

3. Connectors shall be designed to receive #12 AWG tracer wire and shall be rated for 600 volts.

4. Non-locking, friction fit, twist-on or taped connectors are not acceptable. Twisting of tracer wiring is not acceptable.

C. Terminal/Access Boxes:

1. Terminal/access boxes shall be grade level, in-ground or above ground type as applicable, and be specifically manufactured for such applications.

2. Terminal/access boxes shall consist of tubular housing, terminal board and removable cast or ductile iron lid.

3. All boxes shall be appropriately identified with “sewer” cast into the lid and be color coded.

4. Housing and terminal board material shall be high strength ABS or polycarbonate plastic. All materials of construction shall be impervious to chemicals typically used for snow and ice removal and pavement and hardscape maintenance.

5. Acceptable products:

a. Grade level, in-ground type: Equal to Copperhead® Snake Pit™ Concrete/Driveway Box, Part #CD14-TP.

b. Above ground type: Equal to Copperhead® Cobra Hydrant Flange, Part #T3-FLPKG.

6. Terminal board shall have nickel plated brass terminals. Number of terminals shall be as required for specific installation.

D. Grounding Anode:

1. 1.5 lb. x 1.315" dia. x 18.5" long drive-in magnesium anode with HDPE cap and 20' of factory installed #12 AWG copper clad steel conductor with 30 mil HDPE insulation, rated for direct burial use at 30 volts with 21% conductivity.

2. Equal to Copperhead® Anode, Part #ANO-12.

2.3 MARKER POSTS

A. Air relief valve signage shall be aluminum sheeting attached to T-post as shown on the drawings.

PART 3 - EXECUTION

3.1 GENERAL

A. Provide pressure sewer pipe with tracer wire.

B. Provide marking posts for air relief valves where indicated.

C. Utility markers and locators shall be installed in accordance with the manufacturer's recommendations. Have on hand all installation manuals, brochures, and procedures for the equipment and materials concerned.

3.2 INSTALLATION - TRACER WIRE

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 signal for distances in excess of 1000 linear feet, and without distortion of signal caused by multiple wires being installed in close proximity to one another.

B. Tracer wire shall be installed as a single continuous wire, except where using approved connectors. No looping or coiling of wire is allowed.

C. Tracer wire shall be provided in conjunction with all methods of utility installation including open trench and directional drilling/boring.

D. Open Trench Method:

1. Tracer wire shall be placed at the bottom half of the pipe and secured at 5' intervals with non-conductive tape. Additional attachment shall be provided at offsets and fittings in piping system. Tracer wire shall be placed carefully and great care shall be exercised during backfilling operations to maintain physical integrity and position relative to piping.

2. Splices in tracer wire shall be kept to an absolute minimum. When splices are necessary they shall be made with tracer wire connectors as specified herein. Other splicing methods are not allowed.

E. Directional Drilling/Boring Method:

1. Two tracer wires shall be provided with one wire as backup.

2. Tracer wires shall be pulled through bore hole in conjunction with utility pipe. Wires shall be located on opposite sides of utility pipe

3. Tracer wire splices are not allowed in drilled/bored sections.

F. Tracer wires shall be interconnected at intersections of mainlines and branches utilizing single three-way connector at each point of connection.

G. Tracer wire shall be properly grounded at all dead ends and stubs.

1. When grounding the tracer wire at dead ends/stubs, install the grounding anode in a direction 180 degrees opposite of the tracer wire, at the maximum possible distance.

2. 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.

3. 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.

4. 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.

H. Terminal/access boxes shall be located no greater than 1,000 linear feet of developed pipe length apart.

I. Terminal boxes shall not be located in areas where access to box is impeded.

J. Terminal boxes shall be installed flush with finished grade and centered in grade level concrete pad. Concrete pad shall be 24” by 24” minimum, 6” thick, and reinforced with eight #3 bars chaired at mid depth with 3" clearance to edges.

K. Care shall be taken to extend tracer wire from utility pipe to terminal box in an orderly manner as backfill is placed.

L. End of each tracer wire shall be properly landed on dedicated terminal within terminal box and securely tightened. Provide 18-24” excess length for each wire within box. Each terminal shall be clearly identified with permanent label.

3.3 INSTALLATION - MARKER POSTS

A. Install at locations indicated in drawings.

3.4 ACCEPTANCE TESTS

A. Testing of all new tracer wire installations shall be performed using typical low frequency line tracing equipment, witnessed by the Contractor, Engineer and Owner as applicable, prior to final acceptance.

1. Testing shall be performed after backfilling and completion of rough grading, and again after final restoration and prior to final completion.

2. Continuity testing in lieu of actual line tracing will not be accepted.

END OF SECTION 330526

SECTION 330529
UTILITY VALVES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section covers furnishing, hauling, and installing the eccentric plug, check and gate valves at the locations and grades as shown on the plans and herein specified, and all labor, tools, and equipment necessary to properly install the valves.

1. Valves shall be designed for a working pressure of 200 psi and provide tight shut-off at rated pressure.

B. Related Work:

1. Section 333416 - Pressure Pipe Installation

C. References:

1. American National Standards (ANSI):

a. ANSI B16.1 - Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250 and 800.

2. ASTM International (Formerly American Society for Testing and Materials):

a. ASTM A126 - Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings.

b. ASTM C536 - Specification for Ductile Iron Castings.

3. American Water Works Association (AWWA):

a. AWWA C111 - Rubber Gasketed Joints for Ductile Iron Pressure Pipe and Fittings.

b. AWWA C507 - Ball Valves, 6 In. Through 60 In. (150 mm Through 1,500 mm)

c. AWWA C508 – Swing-Check Valves, 2 In. Through 24 In. (50 mm Through 600 mm)

d. AWWA C509 - Resilient Seated Gate Valves for Water and Sewerage Systems.

e. AWWA C550 - Protective Epoxy Interior Coatings for Valves and Hydrants.

1.2 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Furnish certification that products conform to the applicable requirements of the specified standards.

C. Furnish data and illustrations showing materials of construction, principal dimensions and component parts.

1. Recommended spare parts list.

2. Assembly and disassembly or repair instructions.

3. Corrosion protection system details.

1.3 DELIVERY, STORAGE AND HANDLING

A. Valve storage, shipment, and installation shall strictly comply with ANSI/AWWA Standard C500.

1.4 QUALITY ASSURANCE

A. Actuators, their controls and appurtenances shall be the responsibility of the valve manufacturer for proper sizing, assembly, certification, field testing, and any adjustments necessary to operate the valve as specified.

1.5 BASIS OF PAYMENT

A. Measurement: Complete product in place per lump sum.

B. Items Included: As indicated and required for a complete installation.

PART 2 - PRODUCTS

2.1 GENERAL

A. Provide valves of same manufacturer throughout where possible.

B. Provide valves with manufacturer’s name, pressure rating and flow direction clearly marked on outside of body.

C. Valve Connections: Shall be as indicated on the drawings:

2.2 ECCENTRIC PLUG VALVES

A. Acceptable Manufacturers:

1. Dezurik
2. Approved equal.

B. Design and Materials of Construction:

1. The eccentric plug valves shall be cast iron body with corrosion-resistant nickel seat conforming to AWWA Standards C507-73, Sec. 5.1, and C504-74, Sec. 6.4, and ASTM Standard A126, Class B.
2. Bearings shall be heavy duty construction stainless steel and stem shall be sealed by multiple, long-life, packing rings of nitrile-butadiene, with packing and packing gland accessible without disassembly of the valve.
3. Valves shall have a rugged bolted bonnet which shall allow for easy disassembly and top entry to the valve.
4. Plugs shall have a resilient plug facing of neoprene capable of driptight shutoff.
5. The pressure rating shall be 200 psi for valves 12” and smaller and 150 psi for valves 14” through 24”.
6. Floor Stand Assemblies:
    a. Floor stands, extension pipes, and adapters shall be utilized with lever operators in locations shown on the plans.
7. End Connections shall be mechanical joint, flanged or screwed as shown on the drawings.
8. Accessories:
    a. The Contractor shall supply a "T"-wrench operator for all valves having a 2" square actuating nut.

D. Operators:

1. Shall be as called for on the plans, either lever operators, handwheel operators, or extended bonnet handwheel operators.

2. Lever Operators:
   a. All 1/2" to 3" lever actuated valves shall have a bolted-on, non-removable lever and shall be furnished with an adjustable, open position memory stop.
   b. All 4" to 8" lever actuated valves shall have a 2" square actuating nut and shall be furnished with an adjustable, open position memory stop.
   c. All lever-operated valves shall have stainless steel bolting, including stainless steel spring, stud nut, washer, stop screw and nut, and bonnet bolts.
   d. Worm gear type actuators shall be furnished on all 8” and larger valves.

3. Handwheel Operators:
   a. All plug valves utilizing handwheel operation shall be furnished with totally enclosed handwheel actuators sized for a maximum pressure differential across the valve of 100 psi.
   b. Actuator and handwheel shall be sized for the appropriate valve size and pressure drop and shall be of heavy duty construction with worm gear operator.
   c. Valve actuator shall be furnished with an adjustable, open position memory stop and stainless steel bolting. "Open" and "Close", along with arrows, shall be cast into the handwheel.

4. Buried Valve Operators:
   a. Shall be as shown on the drawings, either lever actuated with valve box, or of an extended bonnet design with handwheel operator.
   b. Lever actuated buried valves shall utilize a round top valve box provided with top cover.
   c. Valve box shall be of two-piece type with top piece adjustable to final grade.

2.3 SWING CHECK VALVES

A. Design and Materials of Construction:

1. Swing check valves shall be self-contained, free-swinging disc style, allowing a full waterway and suitable for horizontal installation.
2. Valve disc shall swing freely open and shall be keyed to valve hinge pin without use of pins.
3. Valves shall meet or exceed the design strength, testing and performance requirements of AWWA C508, or latest revision.
4. The pressure rating shall be 200 psi for valves 12” and smaller and 150 psi for valves 14” through 24”.
5. All internal working parts whose removal may become necessary for repairs shall be readily accessible, removable, and replaceable without use of special tools or removal of the valve from the pipeline.
6. Valve Body:
   a. Valve bodies shall be ASTM A-126 Class B cast iron.
   b. Flanges shall be in full compliance with ANSI B16.1 Class 125.
   c. Seats shall be constructed of ASTM B-62 bronze and be mechanically retained in the valve body.

7. Valve Disc:

   a. Disc shall be of cast iron ASTM A-126 Class B with mechanically secured bronze disc seat of ASTM B-62 material.

8. Valve Hinge:

   a. The hinge shall be constructed of ductile iron ASTM A-536 Grade 65-45-12 with a stainless steel hinge pin. Packing shall be non-asbestos type and mechanically adjustable.

2.4 GATE VALVES

A. Design and Materials of Construction:

1. Gate valves shall be outside screw and yoke or non-rising stem equipped with either handwheel operator or a two-inch square operating nut, as indicated on the drawings.
2. The valve shall be iron body, resilient seated, manufactured in accordance with and conforming to standards set forth in the latest revision to ANSI/AWWA C509 for gate valves 3 through 20-inch for water and sewage systems.
3. End connections shall be as indicated on the drawings.

2.5 VALVE BOXES

A. Valve boxes for buried valves shall be located as shown on the drawings.

B. The valve box shall have a round top with open base and shall be provided with a top cover.

C. The valve box shall be of a two-piece type with top piece capable of adjustment to final grade.

D. Valve boxes for buried pipe shall be provided with a reinforced concrete pad at ground level.

PART 3 - EXECUTION

3.1 INSTALLATION OF PLUG VALVES

A. Each plug valve shall be installed at the locations and grades as shown on the drawings.

B. The Contractor shall insure that the valve is operating freely and that the valve box, if required, is properly placed to allow the use of the necessary tools for the operation of the valve and is plumb and centered over the operating nut on the valve.

C. When buried, the tops of the valve boxes shall be level with the finish elevation of the ground.

D. If the top of the operating nut is more than two feet below the finish grade, a permanently installed valve stem extension shall be installed in the valve box, raising the nut to within six inches of the ground surface.

E. The Contractor shall insure that the operator, whether it be lever or handwheel, is properly placed to allow convenient operation and/or disassembly of the valve.

F. All valves shall be installed in strict accordance with manufacturer's instructions.

3.2 INSTALLATION OF SWING CHECK VALVES

A. The Contractor shall insure that the check valves are positioned correctly as to direction of required flow.

B. Before installation, each valve shall be thoroughly cleaned of all foreign material.

C. The valve seats shall be inspected for irregularities.

3.3 INSTALLATION OF GATE VALVES

A. Each gate valve shall be installed at the locations and grades as shown on the plans.

B. The Contractor shall insure that the valve is operating freely and that the valve box, if required, is properly placed to allow the use of the necessary tools for the operation of the valve and is plumb and centered over the operating nut on the valve.

3.4 INSTALLATION OF VALVE BOXES

A. When buried, the tops of the valve boxes shall be level with the finish elevation of the ground.

B. If the top of the operating nut is more than two feet below the finish grade, a permanently installed valve stem extension shall be installed in the valve box, raising the nut to within six inches of ground surface.

3.5 ACCEPTANCE TESTING

A. Perform on piping and valves as specified in Section 333416.

END OF SECTION 330529

SECTION 333113
SANITARY SEWER SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section covers materials, installation, and testing of gravity sewer pipe and related appurtenances as shown on the drawings.

B. Related Work:

1. Section 312333 - Trenching and Backfilling for Utilities
2. Section 330516 - Utility Structures
3. Section 330517 - Gravity Sewer Pipe and Fittings

C. References

1. American Society for Testing and Materials (ASTM):

a. ASTM D2321 - Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.

b. ASTM F1417 - Installation Acceptance of Plastic Gravity Sewer Lines Using Low Pressure Air.

1.2 DELIVERY, STORAGE AND HANDLING

A. All materials shipped by rail shall be carefully inspected for damage in transit in the cars.

1. If damaged material is found, it shall not be unloaded except upon instructions from the official freight agent.
2. In the event of damaged pipe, it may be lifted out of the cars and placed along the switch site, but no material shall be removed from the railroad company property.

B. All materials shipped by truck shall be carefully inspected for damage in transit.

1. If materials are delivered by truck, they shall be inspected as they are unloaded.
2. Damaged pipe shall not be left at the job site but shall be removed promptly so that rejected material will not mistakenly be used in construction.

C. All pipe, pipe fittings, and other accessories and materials shall be unloaded in such a way as to avoid damage due to shock.

1. Under no circumstances shall pipe be dropped to the ground from cars or trucks.
2. Special precautions shall be taken to prevent one pipe from striking another forcefully.

D. All materials shall be placed for storage in suitable places as approved by the Engineer.

E. As pipe is placed along the intended alignment of the trench, it shall be placed with bell ends facing the direction in which work will proceed (upstream), unless otherwise directed.

F. Before pipe is lowered into the trench, the pipe shall be inspected for defects. The pipe shall be rung with a light hammer to detect cracks. Any defective, damaged, or unsound pipe shall be rejected.

1.3 BASIS OF PAYMENT

A. Measurement: No measurements will be made for work under this Section. Payment will be made on a lump sum basis.

B. Items included: As indicated and required to complete the work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Specified in related sections.

PART 3 - EXECUTION

3.1 INSTALLATION

A. All pipes, pipe fittings, etc. shall be lowered into the trench piece by piece by means of derricks, ropes, or other suitable equipment. Under no circumstances shall pipe or other materials be dropped into the trench.

1. The pipe shall be laid with bell holes upstream, i.e., in the direction of laying operations.

B. Pipe shall be laid in a bed of granular stone as shown on the drawings.

C. In all cases, full-length joints of pipe shall be used except in making closures.

D. The pipe shall be laid on grade with a grade rod that has an iron heel for the invert and notches for the line stretched over the pipe between the grade boards.

E. Grade lines shown on the profile drawings are the internal invert lines of the sewer pipe.

F. Pipe laying machines, laser beams, or other devices may be used in lieu of a grade rod only with the prior approval of the Engineer.

G. After the pipe is set and on grade, granular stone bedding shall be deposited in the trench to a depth of at least six (6) inches over the top of the pipe. This shall be carefully deposited in uniform layers not exceeding six (6) inches with each layer carefully and solidly tamped in such a manner to prevent disturbance of the line and grade.

H. Bedding and backfilling of the pipe shall be in accordance with Section 312333 – TRENCHING AND BACKFILLING FOR UTILITIES.

I. At the close of each day's work, or when pipe is not being laid, the end of the pipe shall be stopped to overcome possible uplift and prohibit contamination.

J. Any pipe which settles before acceptance, or which is not in true alignment, shall be taken up and replaced by the Contractor at his expense.

K. Where buildings, structures, improvements, or materials of value are encountered in the area where sewer line is to be installed, the Contractor shall provide for the removal, protection, and disposition of these elements.

L. The Contractor shall consult with the Owner and Engineer relative to the proposed means of removal.

M. All fences disturbed during construction shall be restored to a condition at least equal to that which existed prior to construction, unless specifically directed otherwise by the drawings.

N. Certain repaired fence sections shall require installation of a fence gate. Locations of these gates shall be as called out on the drawings.

O. Gates shall conform to the details shown on the drawings.

3.2 JOINTING

A. At all pipe joints, the granular stone bedding shall be excavated sufficiently so that the pipe bell will not rest on the bedding materials, but all the weight of the pipe shall be evenly distributed along the entire length of the barrel of the pipe.

B. Care shall be taken to ensure that the joints of the pipe are clean and free of any foreign material and constructed watertight at all points.

1. Any leaks or other defects discovered at any time before the final acceptance of the work shall be immediately repaired, or that portion of the sewer rebuilt, if necessary.

3.3 BUILDING SEWER CONNECTIONS

A. All existing active sewer service lateral lines shall be reconnected to the newly constructed wastewater collection main.

B. Slope: Four (4) inch diameter lateral lines shall be laid at a uniform minimum slope of 0.011 ft/ft (1.1%) and six (6) inch diameter lateral lines shall be laid at a uniform minimum slope of 0.006 ft/ft (0.6%).

C. Trenching, Bedding, and Backfilling: Shall be as specified in Section 321540 – AGGREGATES SURFACING, and Section 312333 – TRENCHING AND BACKFILLING FOR UTILITIES.

D. Depth: Lateral lines shall be installed so as to have minimum 30 inches of cover above the top of the pipe.

E. Lateral lines shall be installed with a single cleanout located as close as practical to the building being served, but within 200 feet of the centerline of the interceptor or collector line. Cleanouts shall be constructed using PVC 45-degree wyes and a PVC cap at the ground surface. Top of cleanout shall not be located in depressions likely to collect surface water.

F. Connection of the service lateral to the new sewer main shall be accomplished by use of a standard tee or wye. Installation shall be in accordance with the manufacturer’s written installation instructions.

G. Ground surfaces disturbed by construction of sewer service lateral lines shall be fully restored to a condition equal to that which existed prior to construction.

3.4 CUTTING PIPE

A. All cutting of pipe shall be done in a neat manner with the least amount of waste of pipe involved and without damage to existing or new pipe lines.

3.5 CONNECTIONS TO EXISTING SEWER LINES AND STRUCTURES

A. Connect sewer pipe to existing sewer line or structure as required or indicated.

B. Conform to Specifications regarding joint locations, type of joints and pipe materials.

C. Connect sewer pipe to existing sewer line with approved coupling designed and fabricated for intended purpose.

D. Connect sewer pipe to new or existing structure using waterstop to ensure watertight seal between pipe and structure wall.

E. Prepare structure by core drilling an opening with at least 3 inches clearance all around waterstop fitting to be installed.

F. Repair opening with non-shrink grout.

G. Provide cast-in-place wall sleeves in lieu of core drilling where required or indicated.

3.6 TEMPORARY PLUGS

A. Furnish and install temporary plugs at contract separation points for removal by others to complete connection to piping laid under adjacent contract.

1. Secure in place in a manner to facilitate removal when required to connect pipe.

B. Remove temporary plugs from pipe as required to complete connections to existing pipe.

C. Furnish and install test plugs as necessary to complete required acceptance tests.

1. Tests plugs shall be as recommended by pipe manufacturer.
2. Be watertight against heads up to specified test pressures.

3.7 PIPE ANCHORS

A. Anchorage of Bends, Tees, Etc.

1. All bends, tees, caps, and plugs on all sewers shall be squarely anchored by suitable thrust concrete backing. Such concrete backing shall be so placed that the pipe or fitting joints will be accessible for repair.
2. Concrete shall be 1:3:5 mix and shall be placed between solid ground and the fitting to be anchored.
3. The area of the bearing on the pipe and the ground in each instance shall be a minimum of 6 square feet.

3.8 GRAVITY SEWER ACCEPTANCE TESTS

A. All completed gravity sewers shall require pneumatic or hydrostatic testing for the purpose of locating potential infiltration and/or exfiltration within the system.

B. Pneumatic Testing Procedure

1. The Contractor shall perform low pressure air testing on all sections of completed sewer 8-inch through and including 36-inch diameters, in the presence of the Engineer.
2. Completed sewer larger than 36-inch diameter may use hydrostatic testing.
3. It will be the responsibility of the Contractor to furnish and operate equipment capable of making the required tests.
4. Pneumatic plugs shall be utilized to isolate sewer sections for testing. Plugs shall have a sealing length equal to or greater than the diameter of the pipe to be inspected.
5. Pneumatic plugs shall resist internal test pressure without requiring external bracing or blocking.
6. All air used shall pass through a single control panel and three individual hoses shall be used for connections from the control panel to 1) pneumatic plugs for inflation; 2) sealed line for introducing the low-pressure air; and 3) to the sealed line for continually monitoring the air pressure rise in the sealed line.
7. Equipment shall be Cherne Air-Loc equipment or approved equal. Testing methods and air leakage rates shall conform to ASTM F1417, latest revision, as a minimum. Otherwise, the following procedures shall be followed:

C. Pipe Above Groundwater Table:

1. All pneumatic plugs shall be seal-tested before being used in the actual test installation.
2. One length of pipe shall be laid on the ground and sealed at both ends with the pneumatic plugs to be checked.
3. Air shall be introduced into the plugs to 25 psig.
4. The sealed pipe shall be pressurized to 5 psig.
5. The plugs shall hold against this pressure without bracing and without movement of the plugs of the pipe.
6. After a manhole-to-manhole reach of pipe has been backfilled and cleaned and the pneumatic plugs are checked by the above procedure, the plugs shall be placed in the line at each manhole and inflated to 25 psig.
7. Low-pressure air shall be introduced into this sealed line until the internal air pressure reaches 4 psig greater than the average back pressure of any groundwater that may be over the pipe.
8. At least two (2) minutes shall be allowed for the air pressure to stabilize.
9. After the stabilization period (3.5 psig minimum pressure in the pipe), the air hose from the control panel to the air supply shall be disconnected.
10. The portion of line being tested shall be termed "Acceptable" if the time required in minutes for the pressure to decrease from 3.5 to 2.5 psig is not less than the time shown for the given diameters in the following table:

Pipe Diameter (inches)	Minimum Time (min.:sec.)	Max. Length (ft.) for Min. Time	Time (sec.) for Longer Length (L)
4	3:46	597	0.380 L
6	5:40	398	0.854 L
8	7:34	298	1.520 L
10	9:26	239	2.374 L
12	11:20	199	3.418 L
15	14:10	159	5.342 L
18	17:00	133	7.692 L
21	19:50	114	10.470 L
24	22:40	99	13.674 L
27	25:30	88	17.306 L
30	28:20	80	21.366 L
33	31:10	72	25.852 L
36	34:00	66	30.768 L

D. Pipe Below Groundwater Table:

1. In areas where groundwater is known to exist, the Contractor shall install a one-half inch diameter capped pipe nipple, approximately 10" long, through the manhole wall on top of one of the sewer lines entering the manhole. This shall be done at the time the sewer line is installed.
2. Immediately prior to the performance of the test, the groundwater shall be determined by removing the pipe cap, blowing air through the pipe nipple into the ground so as to clear it, and then connecting a clear plastic tube to the nipple.
3. The hose shall be held vertically and a measurement of the height in feet of water over the invert of the pipe shall be taken after the water has stopped rising in this plastic tube.
4. The height in feet shall be divided by 2.31 to establish the pounds of pressure that will be added to all readings. For example, if the height of water is 11-1/2 feet, then the added pressure will be 5 psig. This increases the 3.5 psig to 8.5 psig, and the 2.5 psig to 7.5 psig.

5. The allowable drop of one pound and the timing remain the same.

E. Testing of Manholes and Large Diameter Sewer Lines:

1. The Contractor will be required to make either hydrostatic or vacuum infiltration/exfiltration tests of all manholes and sewer lines larger than 36-inch diameter not pneumatically tested in the presence of the City, to demonstrate that the manholes and/or sewer lines are free of leaks.
2. Each manhole-to-manhole section shall be tested. Satisfactory test results must be obtained before the line, or any part thereof will be accepted.

F. Hydrostatic Testing:

1. Where the top of the sewer is below water level, a one-half inch (½") galvanized pipe nipple is to be cast into each manhole wall and capped on the inside.
2. The pipe nipple is to be located at the top of the inside bore of sewer pipe. All tests are to be conducted in the following manner:
3. Test plugs are to be placed in the end of each sewer pipe on the upstream side of both manholes and inflated to a maximum pressure of 16 psig.
4. Plugs are to be thoroughly blocked to prevent them from blowing out.
5. The sewer pipe and manhole shall be filled with water to a level four and one-half feet (4-½') above the groundwater level or seven (7') feet above the pipe invert, whichever is higher.
6. Ten minutes shall then be allowed for absorption, after which the water level shall be brought back to the test elevation.
7. The specified head shall be maintained on the manhole for a period of eight (8) hours.
8. Sufficient water shall be added to maintain this level. All water added shall be metered to within one-tenth of a gallon and recorded.
9. The maximum allowable leakage shall be as specified herein. If zero (0) water loss is recorded after two (2) hours of testing, the testing may be considered complete, and the test section accepted.
10. The Contractor shall provide all water, pumping facilities, and metering facilities necessary to perform the tests. After each test, all test water is to be pumped out by the Contractor.

G. Vacuum Testing:

1. Vacuum testing, performed in accordance with this specification, shall be allowed as a substitute method for hydrostatic testing of manholes.
2. The vacuum test equipment shall be approved by the Engineer prior to commencing manhole testing.
3. The vacuum "test head" assembly shall be placed inside the frame of the manhole cover, in order to include in the test, the seal between the frame and the manhole cone section, slab, or adjusting rings.
4. Plugs shall be placed at least eight (8) inches inside all pipes entering the manhole. Location of plugs shall be such that when inflated, they are past the gasket seal or joint of the manhole and sewer pipe.
5. All plugs shall be braced sufficiently to prevent the plug or pipe from becoming dislodged and drawn into the manhole.
6. A vacuum of at least 10½ inches mercury shall be drawn on the manhole.

7. The valve on the vacuum line to the manhole shall be closed, and the vacuum line disconnected.
8. The vacuum within the manhole shall then be adjusted to 10 inches of mercury by opening the vacuum line valve.
9. A liquid-filled pressure gauge having a face of 3½ inches and reading from zero to 30 inches of mercury shall be utilized.
10. The time for the vacuum reading to drop from 10 inches of mercury to 9 inches of mercury must be equal to or less than the following values in order for the manhole to be considered as passing the vacuum test.

Manhole Depth	Time (minutes)
10 feet or less	2.0
10.1 feet to 15 feet	2.5
15.1 feet to 25 feet	3.0

11. If vacuum drops less than one (1) inch mercury within the test time, the manhole is considered acceptable and passes the test.
12. If manhole fails and leaks, the contractor shall make the needed repairs and test again until satisfactory results are obtained.
13. Test may be done before backfilling but shall be repeated after backfilling.
14. All safety procedures, placing of plugs, and bracing, labor, and other work required for testing will be the responsibility of the contractor.
15. The Contractor shall supply all required test plugs, vacuum plate, and vacuum pump.

H. Infiltration/Exfiltration Allowance:

1. Infiltration or exfiltration for sewers 8-inch through 12-inch diameter shall not exceed 200 gallons per inch of pipe diameter per mile per day for any section of sewer.

I. Infiltration/Exfiltration Elimination:

1. The Contractor shall locate all sources of infiltration and exfiltration in the sewer lines, manholes, and appurtenances, and shall correct deficiencies and eliminate infiltration/exfiltration sources in a manner approved by the Engineer.
2. All sections of sewer line, manholes, and appurtenances shall be re-tested after corrections are finalized.
3. The Contractor shall carry the sole responsibility for providing a sewer system having infiltration or exfiltration below the specified limits.

J. Deflection Test:

1. Deflection test shall be performed on all flexible pipe not less than thirty days after the placement of final backfill.
2. The deflection test shall consist of hand-pulling a rigid ball or mandrel through the installed pipe in the presence of the Engineer.
3. The rigid ball or mandrel shall have a diameter equal to 95 percent of the inside diameter of the pipe.
4. If the rigid ball or mandrel fails to pull through the pipe, the section being tested fails the test and will be replaced by the Contractor at no expense to the Owner.

END OF SECTION 333113

SECTION 333416
PRESSURE PIPE INSTALLATION

PART 1 - GENERAL

1.1 SUMMARY

A. This section covers delivery, storage, handling, and installation of pressure pipe and related appurtenances as shown on the drawings.

B. Related work:

1. Section 312333 - Trenching and Backfilling for Utilities
2. Section 330518 - Pressure Pipe and Fittings

C. References

1. ASTM International (Formerly American Society for Testing and Materials):

a. ASTM D2855 - Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.

2. American Water Works Association (AWWA):

a. AWWA C600 - Installation of Gray and Ductile Iron Water Mains and Appurtenances.

b. AWWA C605 - Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water.

1.2 DELIVERY, STORAGE AND HANDLING

A. Inspect all pipe, fittings, and appurtenances delivered to job site for damage in transit.

1. Do not unload damaged material except upon the instruction of the official freight agent.
2. Promptly remove any damaged materials that are unloaded from the job site so that rejected material will not be mistakenly used in the Work.

B. Handle pipe, fittings and appurtenances in a manner to ensure installation in sound and undamaged condition.

1. Do not drop or bump.
2. Use slings, lifting lugs, hooks and other devices designed to protect pipe, joint elements and coatings.
3. Ship, move and store in a manner to prevent movement or shock contact with adjacent units.

C. Store all pipe, fittings and appurtenances in suitable places as approved by the Resident Engineer.

1.3 BASIS OF PAYMENT

A. All Work under this Section shall be considered incidental to other related Work and no measurement or direct payment will be made.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Specified in related sections.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Utilize equipment, methods and materials ensuring installation to lines and grades indicated.

1. Maintain alignment within a tolerance of ± 12 inches per 100 feet.
2. Where grades are not shown or indicated, lay pipe to grade between control elevations shown.
3. Unless otherwise indicated, maintain a minimum cover of 42 inches over top of pipe.
4. Accomplish horizontal and vertical curve alignments with fittings and pipe deflections.

a. Limit joint deflection with ductile-iron pipe and fittings to conform to AWWA C600 (≤ 3-degrees).
b. Limit joint deflections for PVC pipe joints to conform to AWWA C605 (≤1-degree).

5. Do not lay pipe on block supports unless pipe is to receive total concrete encasement.
6. Obtain acceptance of method proposed for transfer of alignment from control to the Work.

B. Install pipe of size, materials, strength class, and joint type with embedment indicated for plan location.

C. Insofar as possible, install pipe with spigot ends in direction of flow.

D. Clean interior of pipe, fittings and joints prior to installation. Prevent entrance of foreign matter during installation and when work is suspended or stopped.

1. Close open end of pipe with tight-fitting enclosure.
2. Do not allow water to fill trench. Prevent floatation if water prevention measures prove inadequate.
3. Remove water, mud and other undesirable material from trench before removing end closure.

E. Brace or anchor as required to prevent displacement after establishing final alignment.

F. Perform only when weather and trench conditions are suitable. Do not lay in water.

G. Separation of water mains, sanitary sewers and sewage force mains:

1. Parallel Installation: Maintain at least 10 feet horizontal separation, measured edge to edge, between water mains and existing or proposed sewer lines. In cases where it is impractical to maintain 10 feet separation, install water main in a separate trench or on an undisturbed shelf located on one side of the sewer line with at least 18 inches vertical separation between bottom of water main and top of sewer piping. In areas where the above specified separations cannot be obtained, the sewer line shall be constructed of slip-on or mechanical joint pressure rated pipe or cased in a continuous and be pressure tested to 150 pounds per square inch to assure water tightness.
2. Crossings: Whenever water mains and sewer lines intersect, maintain at least 18 inches vertical separation, measured edge to edge, between the water main and sewer piping

whether the water main is above or below the sewer line. Arrange crossing so that water main joints are equidistant and as far as possible from the sewer line but in no case less than 10 feet. In areas where the above specified separation cannot be obtained, the sewer line shall be constructed of slip-on or mechanical joint pressure rated pipe or cased in a continuous casing that extends no less than 10 feet on both sides of the crossing and be pressure tested to 150 pounds per square inch to assure water tightness.

3. Maintain at least 10 feet horizontal separation between water mains and sewage force mains, and install in separate trenches. In areas where the above specified separation cannot be obtained, either the water main or force main shall be cased in a continuous casing.
4. No waterline shall be located closer than 10 feet to any part of a sanitary sewer manhole.

3.2 JOINTING

A. General Requirements:

1. Locate joint to provide for differential movement at changes in type of pipe embedment, impervious trench checks and structures.

    a. Not more than 12 inches from structure wall, or as indicated or directed.

2. Perform in accordance with pipe manufacturer's recommendations.
3. Clean and lubricate all joint and gasket surfaces with lubricant recommended by pipe manufacturer. Joint lubricant shall be suitable for use with potable water, be stored in closed containers, and kept clean.
4. Utilize methods and equipment capable of fully homing or making up joints without damage or over-belling.
5. Excavate bell holes at each joint to provide full length barrel support of the pipe and to prevent point loading at the bells.

B. Special Requirements for Solvent-Cemented Joints:

1. Joint preparation, cutting and jointing procedures shall comply with ASTM D2855.
2. Chamfer or bevel pipe ends 10 to 15 degrees or as recommended by pipe manufacturer.
3. Block or restrain newly assembled joints to prevent movement during the setting time recommended by pipe manufacturer.
4. Pressure testing of solvent welded piping systems shall not be performed until the applicable curing time, as set forth in Table X2.1 of ASTM D2855, has elapsed.

C. Special Requirements for Push-On Joints:

1. Joint preparation and jointing procedures shall conform with requirements of AWWA C605 for PVC pipe and AWWA C600 for ductile iron pipe.
2. Verify that each spigot is chamfered or beveled to facilitate assembly.
3. Keep the joint straight while pushing the spigot end into the bell end of the pipe. Use timber header between pipe and pushing device. Take care to not over-bell the joint.
4. Make deflection after the joint is assembled.

D. Special Requirements for Mechanical Joints:

1. Joint preparation and jointing procedures shall conform with the requirements of AWWA

C600.

2. Keep the joint straight during assembly.
3. Make deflection after joint assembly but before tightening bolts.
4. Tighten bolts to the torque values listed in Table 3 of AWWA C600.
5. If effective sealing is not obtained, the joint shall be disassembled, thoroughly cleaned and reassembled.
6. Over-tightening of bolts to compensate for poor installation practice will not be permitted.

E. Special Requirements for Flanged Joints:

1. When bolting flanged joints, avoid restraint on opposite end of pipe or fitting.
2. Tighten bolts gradually and uniformly to ensure uniform compression of the gasket.

3.3 CUTTING PIPE

A. Cut in a neat manner without damage to pipe.

B. Cut ductile iron pipe with Carborundum saw or other method recommended by pipe manufacturer.

C. Remove burrs and sharp edges and bevel or chamfer end of pipe.

D. Repair any damage to pipe lining and seal coat as required and approved.

3.4 CONNECTIONS TO EXISTING PIPELINES AND STRUCTURES

A. Connect pipe to existing pipeline or structure as required or indicated.

B. Conform to Specifications regarding joint locations, type of joints and pipe materials.

C. Connect pipe to existing pipeline with approved coupling designed and fabricated for intended purpose.

D. Connect pipe to new or existing structure using waterstop to ensure watertight seal between pipe and structure wall.

1. Prepare structure by core drilling an opening with at least 3 inches clearance all around waterstop fitting to be installed.
2. Repair opening with non-shrink grout.

3.5 TEMPORARY PLUGS

A. Furnish and install temporary plugs at contract separation points for removal by others to complete connection to piping laid under adjacent contract.

1. Secure in place in a manner to facilitate removal when required to connect pipe.

B. Remove temporary plugs from pipe as required to complete connections to existing pipe.

C. Furnish and install test plugs as necessary to complete required acceptance tests.

1. Test plugs shall be as recommended by pipe manufacturer.
2. Be watertight against heads up to specified test pressures.

3.6 PIPE ANCHORS AND THRUST BLOCKS

A. Conform to the dimensions and details shown in the drawings.

B. Place pipe anchors and thrust blocks against unyielding, undisturbed earth or rock.

1. Install pipe anchors at locations indicated on the drawings
2. Install thrust blocks at tees, elbows, bends, and dead ends as required.

3.7 CORROSION PROTECTION

A. Surface preparation and finish painting exposed interior and exterior ductile iron piping and fittings are specified in Section 099100.

B. Polyethylene Encasement: All buried ductile iron pipe, fittings and specials shall be provided with at least one wrap of polyethylene encasement. Where ductile iron pipe is also encased in concrete the polyethylene encasement shall extend at least 5-feet into each end of the concrete encasement.

3.8 ACCEPTANCE TESTS

A. Perform hydrostatic pressure and leakage tests on the full length of all pressure pipe installed.

1. Conform with AWWA C600 procedures.
2. Perform after backfilling.

B. Test in progressive sections as determined by Contractor and approved by Engineer.

C. Furnish water source and all facilities required to conduct tests including:

1. Pumping equipment.
2. Water meter.
3. Temporary plugs.
4. Anchors, braces and other devices required to withstand hydrostatic pressure on plugs.

D. Limit fill rate of line to available venting capacity. Regulate fill rate to limit velocity in lines when flowing full to not more than 1/2 fps.

E. Before applying the specified test pressure, air shall be completely expelled from the pipe line. If hydrants or blow-offs are not located at all high points, Contractor shall install saddle and corporation cocks at such high points so that the air can be expelled as the test section is filled with water.

G. Apply test pressure by means of a pump connected to the pipe in a manner satisfactory to the Engineer.

H. Any exposed pipe, fittings, valves, hydrants and joints shall be examined carefully during the test for damage or defects.

I. Testing:

1. Installed pressure sewer lines shall be hydrostatically tested as follows.
2. Testing shall include both a "pressure test" of at least two hours duration for the purpose of blowing defective joints, and a "leakage test" to determine actual loss of water from the system.

3. The use of compressed air for testing pipe will not be permitted.

4. Contractor shall be responsible for adequately plugging and bracing, as necessary, the ends of the pressure sewer, whether they be at the lift station or at the discharge location, to allow for the hydrostatic testing.

J. Pressure Test:

1. After the pipe has been laid, all newly laid pipe shall be subjected to a hydrostatic pressure of at least 100 psi at the lowest point in the system.

K. Test Pressure Restrictions:

1. Test pressures shall be (1) of at least 2-hour duration; (2) not vary by more than ±5 psi; (3) not exceed twice the rated pressure of the valves or hydrants when the pressure boundary of the test section includes closed gate valves or hydrants.

L. Pressurization:

1. Each valve or isolated section of pipe shall be filled with water slowly and the specified test pressure, based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge, shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Owner.

M. Air Removal:

1. Before applying the specified test pressure, air shall be expelled completely from the pipe.

2. After all the air has been expelled, the test pressure shall be applied.

N. Examination:

1. All exposed pipe, fittings, valves, and joints shall be examined fully during the test.

2. Any damaged or defective pipe, fittings, valves, or hydrants that are discovered following the pressure test shall be repaired or replaced with sound material and the test shall be repeated until it is satisfactory to the Owner.

O. Leakage Test:

1. A leakage test shall be conducted concurrent with the pressure test.

2. Leakage shall be defined as the quantity of water that must be supplied into the new laid pipe, or any valved section thereof, to maintain pressure within 5 psi of the specified test pressure after the air in the pipeline has been expelled and the pipe has been filled with water.

3. No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{ND\sqrt{P}}{7400}$$

In which L is the allowable leakage in gallons per hour; N is the number of joints in the length of pipeline tested; D is the nominal diameter of the pipe in inches; and P is the average test pressure during the leakage test, in pounds per square inch gauge. When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gal/hr/in. of nominal valve size shall be allowed.

4. Acceptance shall be determined on the basis of allowable leakage.

5. If any test of pipe laid discloses leakage greater than that specified above, the Contractor shall, at his own expense, locate and repair the defective material until the leakage is within the specified allowance.

6. All visible leakages are to be repaired regardless of the amount of leakage.

END OF SECTION 333416

SECTION 407113
MAGNETIC FLOW METER

PART 1 - GENERAL

1.1 SUMMARY

A. The work in this section consists of furnishing and installing one (1) new magnetic flow meter assembly and all associated circuitry to continuously and accurately measure flow in closed pipe section as shown on drawings, record, and transmit flow data to the City of Nevada's existing Advanced Metering Infrastructure (AMI) system, including all labor, equipment, materials, supervision, and incidentals for a complete and functioning system.

B. The flow meter shall be supplied and started up by the factory authorized representative.

C. The Contractor shall be responsible for completing a path study prior to opening bids to determine if additional AMI infrastructure (base station, gateway, repeater, etc.) is required for end point to communicate with City's existing head end system.

D. The 6" flow meter shall operate over a range of 16 to 2,560 gpm.

E. Units shall operate on a standard voltage of 117 VAC ±10%, 60 Hz.

F. The principal items shall include the following:

1. Flow tube.
2. Flow converter
3. Sensor and power cables
4. Surge protection
5. Radio Transmitter (ERT)
6. Any additional AMI infrastructure (base station, gateway, repeater, etc.) that may be required for communication with the AMI head end system.

G. Related work:

1. Section 330518 - Pressure Pipe and Fittings
2. Division 26 - Electrical

H. References:

1. American National Standards Institute (ANSI).

a. ANSI B16.1 - Cast-Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250 and 800

1.2 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Product Data: Manufacturer's catalog data and illustrations showing principal dimensions, parts and materials. Include technical description and specifications.

C. Corrosion protection system details.

D. Application performance guarantee.

E. Installation/operating instructions and service manuals for the specific equipment provided.

F. The flow meter shall be supplied and started up by the factory authorized representative.

G. AMI path study showing that the proposed meter will be able to communicate with the City of Nevada's existing head end system. If not, path study shall determine what additional infrastructure will be required and where it shall be located.

1.3 QUALITY ASSURANCE

A. New magnetic flow metering equipment described herein shall be supplied and warranted by a single manufacturer.

B. The new magnetic flow metering assemblies shall be manufactured by:

1. McCrometer

2. Approved equal.

C. The AMI system components shall be compatible with the City's existing system and supplied by:

1. Core and Main (Sensus AMI)

2. Approved equal.

1.4 BASIS OF PAYMENT

A. Measurement: Complete product in place per lump sum.

B. Items Included: As indicated and required for a complete installation.

1. If path study shows additional infrastructure is required, those components and their installation shall be included in the lump sum price. No additional compensation shall be allowed.

PART 2 - PRODUCTS

2.1 MAGNETIC FLOW METER

A. General:

1. Flow meter assembly shall consist of a magnetic flow tube and converter.

2. Converter shall have intelligent microprocessor-based electronics with automatic zeroing and built-in calibration, and shall have full capability of unidirectional or bi-directional flow metering.

3. The microprocessor shall include diagnostic software to provide external indication of a fault and the fault location.

4. Converter shall be mounted remote from the flow tube.

B. Flow Tube:

1. The flow sensor shall have a 304 stainless steel tube with ANSI Class 150 carbon steel flanges.

2. Diameter of flow tube shall be as shown on the drawings.

3. Liner shall be NSF approved, fusion bonded epoxy.

4. The flow meter electrodes shall be 316Ti stainless steel.

5. The pipe flow section shall be flanged, suitable for operation with normal fluid temperatures over a range of 40°F to 160°F.

6. The flow meter shall be furnished with built-in grounding electrodes of the same material as the sensing electrodes.
7. No external grounding rings or straps shall be required.
8. Face-to-face overall lengths shall conform to ISO/DIS Standard 13359.
9. Flow tube shall be designed to operate in harsh environments.
10. Enclosure shall be weatherproof as defined in IEC IP67, and provide watertight and corrosion-resistant protection of NEMA 6 – Total Submergence to 33 feet.
11. Flow tube shall be calibrated for use with pulse DC coil excitation.
12. Flow tube shall be factory wet calibrated with converter to verify their specified accuracy of ±0.5% of measured value ±0.006 fps with trace ability to NIST and EN45001.
13. Flow tube shall be capable of unidirectional and bi-directional flow without any impact on accuracy.

C. Converter:

1. Shall be factory calibrated to specified accuracy with equipment traceable to the NIST.
2. Inputs span adjustment shall be continuous from 0 – 1.65 and 0-32 fps.
3. Accuracy shall be ±0.5% of reading as system accuracy.
4. Pulse rate shall be adjustable from 10 to 10,000 Hz.
5. Converter shall withstand (1) a high frequency transient of 2,000 V common mode, 5 x 50 ns impulse, per IEC Standard 801-4, (2) 1,000 V common mode and 500 V normal mode, 1.2 x 20 us impulse, per ANSI/IEEE Standard C62.41-1980 and IEC Standard 801-5, and (3) 6,000 V contact discharge, or 8,000 V air discharge of an electrostatic field, per IEC 801-2.
6. Converter enclosure shall have a single compartment design housing electronics, power supply, and all field terminations.
7. Enclosure shall have four standard conduit/cable access holes.
8. Enclosure shall be weatherproof as defined by IEC IP67, and shall provide watertight and corrosion resistant protection of NEMA 4X.
9. Enclosure compartment shall be of cast aluminum, and shall have a front gasketed cover.
10. Enclosure shall also have an upward hinging clear plastic cover to protect the front panel display and keypad.
11. Enclosure shall have a grey epoxy powder coat finish.
12. The keypad/display for the flow converter shall consist of a 32 alphanumeric character, 2-line, backlighted LCD display and 5-button keypad.
13. The display shall indicate positive total, negative total, net total, net inventory, total, rate in conventional flow units, and flow direction.
14. The analog output signal shall be a 4-20mA and can be configured to operate in unidirectional (single range), unidirectional (multiple range), bi-directional, and bi-directional split range.
15. The converter shall be programmable for up to three different flow ranges when measuring flow in one direction.

16. For bi-directional flow, the converter shall allow a separate flow range for the forward and reverse flow directions.

17. The converter shall provide two programmable relay outputs, which can be used to indicate high or low, flow rate, reverse flow, and to indicate alarm conditions.

18. Digital communication shall allow for remote re-configuration, and for the receiving of continuous self-diagnostic data over the same two wires used for the measurement signal. Readings of:

    Engineering Units (gpm, L/s, etc.)
    Flow Upper Range Value(s)
    Flow Rate in Engineering Units or % Flow
    Displayed Upper Range Value(s)
    Pulse Output Upper Range Value(s)
    Electronic Damping Factor
    Data Transfer Rate (600 or 4800 Baud)
    Line Size (Nominal)
    Meter Factor (Calibration Factor)
    Tag Number or Tag Name
    Geographical Location
    Device Name

    Readings shall not disturb the measurement signal. In addition, the configuration from the converter may be copied with a hand held terminal or PC20 laptop and downloaded to another converter, or saved for future reference.

19. Converter shall be capable of surface mounting, as shown on the drawings.

D. Surge Protection:

1. The flow meter shall be suitably protected from electrical surges by arresters and/or other appropriate protection installed on all power and signal connections.

E. Signal Wire:

1. All signal wire shall be installed as a part of these specifications.
2. In-plant signal wiring shall be installed in conduit, as shown on the drawings.
3. It shall be the Contractor's responsibility under these specifications to install all shielded cable and to properly connect the transmitting and receiving equipment specified herein to said shielded cables.
4. Any splicing of shielded signal cable required for a complete and functioning system shall be done solely by the cable manufacturer.

F. End Point Radio Transmitter (ERT):

1. Provide end point radio transmitter (ERT) capable of communicating data from flow meter to the City of Nevada's existing Sensus AMI system.

2. Mount radio transmitter on flow converter strut as shown on the drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

A. All equipment shall be installed, calibrated, and checked out in strict compliance with the

manufacturer’s instructions and as shown on the drawings.

B. The completed installation shall be fully inspected and tested by a competent, factory-trained representative to ensure compliance with the specifications.

3.2 FIELD TESTING

A. Manufacturer’s Services:

1. The factory-trained representative shall review the installation of the flowmeter and shall provide testing and calibration of the meter.

END OF SECTION 407113

SECTION 412223.16
PORTABLE DAVIT CRANE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for providing a portable davit crane and accessories.

B. Related Work:

1. Section 444629.13 - Sludge Pumps (Submersible Type)

1.2 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Provide manufacturer's catalog data and illustrations showing materials of construction, principal dimensions and component parts.

C. Manufacturer's operating instructions.

1.3 BASIS OF PAYMENT

A. Measurement: Complete product is place per lump sum.

B. Items Included: As indicated and required for a complete installation.

PART 2 - PRODUCTS

2.1 PORTABLE DAVIT CRANE

A. Acceptable Manufacturers:

1. Halliday Products
2. L.K. Goodwin Company
3. Oz Lifting Products
4. Approved equal.

B. Design and Construction Materials: One Type-304 stainless steel, lightweight boom/hand winch, adjustable reach portable davit crane assembly with single line wire rope shall be provided.

1. Boom/Crane Assembly: Unit shall include the mast, boom, hand winch, stainless steel cable, hook, and other appurtenances required for proper operation. Unit shall have up to 1,000 pounds rated capacity. Crane shall rotate 360 degrees on a pin and sleeve bearing in the base or utilize a polymer lined socked. The davit arm shall adjust in 1-inch increments from 24- to 36-inches and the overall height shall be 60-inches.

2. Winch: Shall be marine grade brake winch, supplied with 30 ft. of 1/4–inch Type-304 stainless steel cable with galvanized safety hook.

3. Base: Shall be floor style hoist sockets, Type 316 stainless steel.

PART 3 - EXECUTION

3.1 INSTALLATION

A. All hoisting equipment shall be installed in strict accordance with manufacturer's instructions. Units shall be checked to insure smooth, unbinding operation of hand winch, boom adjustment, and mast rotation.

END OF SECTION 412223.16

SECTION 444629.13
SLUDGE PUMP (SUBMERSIBLE TYPE)

PART 1 - GENERAL

1.1 SUMMARY

A. The work of this section shall consist of furnishing and installing the pumps for a duplex submersible sewage lift station, as shown on the drawings and specified herein, and shall include all tools, labor, supervision, equipment, appurtenances, and incidentals necessary for a complete and functioning wastewater pumping station.

B. Related Work:

1. Section 330516 - Pressure Pipe and Fittings
2. Division 26 - Electrical

C. References:

1. American National Standards Institute (ANSI):

a. ANSI B16.1 - Cast-Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250 and 800.

2. ASTM International (Formerly American Society for Testing and Materials):

a. ASTM A48 - Standard Specification for Gray Iron Castings

3. National Electrical Code (NEC).
4. National Electrical Manufacturer’s Association (NEMA).
5. Underwriter’s Laboratories, Inc. (UL).

1.2 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Manufacturer’s catalog data and illustrations showing principal dimensions, parts, and materials.

1. Pump performance curves showing:

a. Capacity in gpm.
b. Total developed head.
c. Required brake horsepower.
d. Pump efficiency.
e. Required NPSH.
f. Minimum recommended submergence.

2. Complete submersible motor nameplate data.
3. Corrosion protection system details.

C. Complete description of motor control panel including:

1. Control panel layout and dimensioning.

2. Schematic diagram of control panel circuitry.
3. Component data sheets.
4. Narrative description of operation.

D. Installation instructions and drawings showing layout and anchorage of equipment and appurtenances.

E. Operating instructions and service manuals for the specific equipment provided.

1.3 QUALITY ASSURANCE

A. Pumps and related appurtenances shall be coordinated by a single source of supply and responsibility.

1.4 BASIS OF PAYMENT

A. Measurement: Complete product in place per Lump Sum.

B. Items included: As indicated and required for a complete installation.

PART 2 - PRODUCTS

2.1 SUBMERSIBLE NON-CLOG PUMP

A. Acceptable Manufacturers: Subject to compliance with requirements, provide submersible pumps and accessories as manufactured by one of the following:

1. ITT Flygt
2. HOMA

3. Approved equal.

B. Equipment named in Part 2.01 A.1. above was used as the basis for design. Any design changes and associated costs required to incorporate other named manufacturer's equipment or approved substitute into the Work shall be the responsibility of the Contractor.

C. Operational Requirements:

1. Select pumps in accordance with the following design requirements:

a. Design Pumping Rate ..... 350 gpm
b. Static Head ..... 66 ft
c. Friction Head ..... 108 ft
d. Total Dynamic Head (TDH) ..... 174 ft
e. Maximum Speed ..... 3,450 rpm
f. Maximum Motor Size ..... 30 hp
g. Electric Service ..... 3-phase, 277/480V, 60 Hz
h. Number of Pumps ..... 2 (1-Duty & 1-Spare)

2. Shall be designed to pump raw unscreened sewage.

3. Design shall be such that the lifting cover, stator housing, and volute casing are of grey iron construction ASTM A-48, Class 35B, with all nuts, bolts, washers, and other fastening devices coming into contact with the sewage constructed of Type 316 stainless steel.

D. Design and Construction Materials:

1. Pumps shall be centrifugal, non-clog, solids handling, submersible, wastewater type. Pumps shall be automatically connected to the discharge piping when lowered into place

on a guide rail system, requiring no bolts, nuts or fasteners to effect sealing to the discharge connection.

2. Major pump components including motor housing, pump casing, and impeller shall be constructed of cast iron conforming to ASTM A48, Class 30, 35B or Class 40. Castings shall have smooth surfaces devoid of blow holes or other casting irregularities.
3. All mating surfaces of major components shall be machined and fitted with Nitrile or Viton rubber O-rings where watertight sealing is required.
4. All exposed bolts and nuts shall be 300 series stainless steel.
5. Volute/Suction Cover:

    a. The pump volute shall be a single piece grey cast iron, ASTM A-48, Class 35B, non-concentric design with smooth passages of sufficient size to pass any solids that may enter the impeller. Minimum inlet and discharge size shall be as specified. The volute shall have a replaceable suction cover insert ring in which are cast spiral-shaped, sharp-edged groove(s). The spiral groove(s) shall provide trash release pathways and sharp edge(s) across which each impeller vane leading edge shall cross during rotation so to remain unobstructed. The insert ring shall be cast of Hard-Iron (ASTM A-532 (Alloy III A) 25% chrome cast iron) and provide effective sealing between the multi-vane semi-open impeller and the volute housing.

6. Impeller:

    a. The impeller shall be of Hard-Iron (ASTM A-532 (Alloy III A) 25% chrome cast iron), dynamically balanced, semi-open, multi-vane, back swept, screw-shaped, non-clog design. The impeller leading edges shall be mechanically self-cleaned automatically upon each rotation as they pass across a spiral groove located on the volute suction. The leading edges of the impeller shall be hardened to Rc 60 and shall be capable of handling solids, fibrous materials, heavy sludge and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater. The impeller to volute clearance shall be readily adjustable by the means of a single trim screw. The impeller shall be locked to the shaft, held by an impeller bolt and shall be coated with alkyd resin primer.

7. Bearings and Shaft:

    a. The pump shaft and motor shaft shall be the same unit.

    b. Shaft shall be of stainless steel and shall be supported with two heavy duty ball bearings to take radial and thrust loads and a sleeve guide bushing directly above the lower seal to take radial load and act as a flame path for seal chamber.

    c. The impeller shall be connected to a short sturdy shaft in order to minimize shaft deflection.

    d. The shaft shall not extend more than 2½ times its diameter below the nearest support bearing.

8. Shaft Seal:

    a. Each pump shall be provided with a tandem mechanical shaft seal system consisting of two totally independent seal assemblies.

    b. The seals shall operate in a lubricant reservoir that hydrodynamically lubricates the lapped seal faces at a constant rate.

    c. The lower, primary seal unit, located between the pump and the lubricant chamber, shall contain one stationary and one positively driven rotating tungsten-carbide ring.

d. The upper, secondary seal unit, located between the lubricant chamber and the motor housing, shall contain one stationary tungsten carbide seal ring and one positively driven rotating tungsten carbide seal ring.

e. Each seal interface shall be held in contact by its own spring system.

f. The seals shall require neither maintenance nor adjustment nor depend on direction of rotation for sealing.

g. Each pump shall be provided with a lubricant chamber for the shaft sealing system.

h. The lubricant chamber shall be designed to prevent overfilling and to provide lubricant expansion capacity.

i. The drain and inspection plug, with positive anti-leak seal shall be easily accessible from the outside.

j. The seal system shall not rely upon the pumped media for lubrication.

k. The motor shall be able to operate dry without damage while pumping under load.

l. Seal lubricant shall be FDA approved, non-toxic.

9. Seal Failure Detection System: Provide a moisture detection system to indicate seal failure or potential seal failure.

   a. A double electrode shall be mounted in the seal chamber to detect water entering the chamber through the lower seal. Water in the chamber shall cause the red light to come on in the control panel.

10. Motors: The pump motor shall be induction type with a squirrel cage rotor, shell type design, housed in an air filled or oil filled watertight chamber, NEMA B type.

    a. The stator windings and stator leads shall be insulated with moisture resistant Class H insulation rated for 180°C (356°F).

    b. The stator shall be dipped and baked three times in Class F varnish and shall be heat-shrink fitted into the stator housing.

    c. The use of bolts, pins, or other fastening devices requiring penetration of the stator housing is not acceptable.

    d. The motor shall be designed for continuous duty handling pumped media of 40°C (104°F) and capable of up to 15 evenly spaced starts per hour.

    e. The rotor bars and short circuit rings shall be made of cast aluminum. Thermal switches set to open at 125°C (260°F) shall be embedded in the stator lead coils to monitor the temperature of each phase winding.

    f. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the control panel.

    g. The junction chamber containing the terminal board shall be hermetically sealed from the motor by an elastomer O-ring seal.

    h. Connection between the cable conductors and stator leads shall be made with threaded compression type binding posts permanently affixed to a terminal board.

    i. Wire nuts or crimping type connection devices are not acceptable.

    j. The motor and pump shall be designed and assembled by the same manufacturer.

    k. The combined service factor (combined effect of voltage, frequency, and specific gravity) shall be a minimum of 1.15.

    l. The motor shall have a voltage tolerance of plus or minus 10%.

    m. The motor shall be designed for operation up to 40°C (104°F) ambient and with a

temperature rise not to exceed 80°C.

n. A performance chart shall be provided showing curves for torque, current, power factor, input/output kW and efficiency. This chart shall also include data on starting current and torque.

o. The motor horsepower shall be adequate so that the pump is non-overloading throughout the entire pump performance curve from shutoff through run-out.

p. Motor shall be provided with an adequately designed cooling system, and shall be guaranteed to run in a totally, partially or non-submerged condition continuously for a period of 24 hours without injurious damages.

q. Pump motors for the site shall be 30 Hp, 277/480 volt, three-phase.

r. Some pump suppliers may be able to meet the pumping conditions specified with lower horsepower pumps. Pumps with lower or higher horsepower shall be considered for use on the project if submitted to the Engineer for approval 10 days prior to the bid.

11. Cables:

a. The power cable shall be sized according to the NEC and ICEA standards and shall be of sufficient length to reach the junction box without the need of any splices.

b. The outer jacket of the cable shall be oil resistant chloroprene rubber.

c. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet.

d. Power and control cables shall be SOW type construction suitable for use in sewage. Sizing shall conform to NEC.

e. Provide power and control cables which are sealed at the motor and continuous from the motor to the control panel or intermediate junction box as indicated on the drawings.

f. The cable entry seal design shall preclude specific torque requirements to require a watertight and submersible seal.

g. Strain relief shall be provided at each cable entry into the pump.

12. Corrosion protection:

a. Pumps shall be shop painted after assembly for corrosion protection.

b. Pump manufacturer’s standard coating system will be acceptable, provided it is suitable for the service intended.

c. Submit details of proposed coating system with compliance submittal drawings and data.

2.2 PUMP ACCESSORIES

A. Pump Discharge Connection:

1. The pump shall be supplied with a universal coupling which bolts to the pump discharge flange and shall accept the discharge elbow provided by the pump manufacturer.

2. Seal of the pump at the discharge flange shall be accomplished by a simple downward linear motion of the pump with the entire weight of the pump guided to and pressing against the discharge connection; no part of the pump shall bear directly on the sump floor and no rotary motion of the pump shall be required for sealing.

3. Sealing at the discharge shall be affected by a rubber lip to insure a positive leakproof system and for ease of removal.

4. Metal to metal discharge connections will not be considered equal.
5. The pump shall be guaranteed not to leak at the discharge flange.
6. Other forms of guiding, such as straightening vanes, etc., shall not be considered equal.

B. Guide Rail System:

1. Shall be provided for each pump to permit raising and lowering of the unit.
2. Rails shall be Type 316 stainless steel of adequate length to extend from the lower guide holder to the upper guide holder mounted to the concrete opening.
3. Rails shall be provided with intermediate guide bar bracket for attachment to discharge pipe.

C. Pump Lifting Chain/Cable

1. Each pump shall be furnished with a pump lifting chain positive-recovery system consisting of the following components: 20 feet (min.) stainless steel of diameter matching weight of lifting chain required, connected to a short length (approximately 10 links long) of high tensile strength proof-tested chain of required capacity, connected to the lifting eye of the pump; a forged "grip-eye" of wrought alloy steel, provided separately for connection to the end of the lifting chain or cable of the pump lifting device. Operation of the lifting system shall be as follows:
2. Connect small eye of "grip-eye" to end of chain or cable of external mechanical of lifting device.
3. Slip top end of nylon line through large eye of "grip-eye".
4. Lower "grip-eye" to top of pump while maintaining a taut nylon line, making sure short length of chain fastened to pump is also taut.
5. Release tension on nylon line when "grip-eye" has reached pump top. Make certain upper end of nylon line has been secured.
6. Take up tension on cable of chain of lifting device, "grip-eye" will engage links of short chain and lift pump.

2.3 CONTROLS

A. Pump control panel shall be manufactured by a UL panel builder and the assembly shall bear a serialized UL label for “Enclosed Industrial Control Panels”.

B. Control panel shall be provided by the pump supplier.

C. Control Logic:

1. Control system shall provide float controlled starting and stopping of pumps. The system shall alternate between lead and lag for even pump run times.
2. The following conditions will cause an alarm which will be indicated on the enclosure door.

a.	Pump 1 fail	d.	Bypass
b.	Pump 2 fail	e.	Bypass run
c.	High level wet well		

D. Panel Enclosure:

1. Shall be NEMA 4x stainless steel, suitable for mounting as indicated. Enclosure door shall be hinged with a continuous stainless steel hinge pin and secured with fast-operating clamp assembly.

2. Include bolted-on engraved name plates indicating functions of all operating controls and instruments.
3. Provide removable back panel of 14-gauge steel with white enamel finish attached to enclosure with collar studs, to accommodate specified control components. Mount components securely to back panel utilizing screws and washers. Tap back panel to accept mounting screws. Do not use self-tapping screws to mount any components.

E. Panel shall be equipped with the following devices and features, logically arranged with separate power and control sections. Conform to applicable requirements of Sections 260500 and 262816, except as modified herein.

1. Circuit Breakers:

a. Provide properly sized heavy duty thermal-magnetic trip circuit breakers for branch circuit disconnect service and short circuit protection of all motor, control and auxiliary circuits.

b. Circuit breaker operating handles shall be operable without opening the interior swing out door.

2. Motor Starters:

a. The solid state reduced voltage soft start starter shall be UL and CUL listed and consist of an SCR based power section, logic board, and paralleling bypass contactor.

b. The SCR based power section shall consist of six (6) back-to-back SCR's, and shall be rated for a minimum peak inverse voltage rating of 1500 volts PIV.

c. Resistor/Capacitor snubber networks shall be used to prevent false firing of SCR's due to dv/dt effects.

d. The logic board shall be mounted for ease of testing, service, and replacement. The logic board shall be identical through all ampere ratings and voltage classes, and shall be conformably coated to protect environmental concerns.

e. The paralleling bypass contactor shall energize when the motor reaches full speed and close/open under one (1) times motor current.

f. Ratings: The soft start shall be designed to operate in an ambient temperature of 0°C to 40°C.

1) The soft start shall be capable of operation within -15% to +10% of nominal voltage rating and automatically adapt for 50 to 60 Hz.

2) The soft start shall be capable of supplying 300% of rated full load current for 60 seconds at maximum ambient temperature.

2.1 Adjustments and Configurations: All dialog functions, display units, remote functions, terminal blocks, configuration switches, and adjustment potentiometers shall be accessible on the front of the control module.

1. Dialog indication shall provide, as a minimum, the following conditions:

a. Soft start status – ready, starting/stopping, run

b. Motor status – current, torque, thermal state, power factor

c. Fault status – motor thermal overload, starter thermal fault, phase fault,

frequency fault, power supply fault, soft start internal fault, max. start time exceeded, overcurrent fault.

2. The starter shall be preset to the following for adjustment-free operation:

   a. Torque acceleration ramp of 10 seconds
   b. Current limitation to 300% of the motor full load current rating
   c. Class 10 overload protection
   d. Motor current present per NEC and UL tables for standard HP motors.

3. A digital keypad shall be utilized to configure the following operating parameters

   a. Motor full load amps adjustable from 50 to 130% of the controller's rating
   b. Torque ramp adjustable from 1 to 60 seconds
   c. Maximum start time adjustable from 10 to 999 seconds
   d. Selection of freewheel, soft stop
   e. Adjustable soft stop torque ramp time from 1 to 60 seconds
   f. Threshold to change to freewheel following a soft stop from 0 to 100% of the normal motor torque.

4. A digital keypad shall be utilized to configure the following controller parameters as required:

   a. Assignment of controller inputs and outputs
   b. Activation of phase reversal protection
   c. Reset of motor thermal state
   d. Indication of elapsed time in hours of starting, running, stopping.

5. Additional inputs and outputs shall be available to provide the following status indications:

   a. One analog output shall be available for 4 to 20 or 4 to 20 milliamp indication of motor current, torque, thermal state, or power factor.

6. Output relays should provide the following status indications:

   a. Fault trip or soft start: One Form A and one Form B minimum
   b. Thermal pre-alarm: One Form A, One Form B, and one Form C minimum
   c. End of start (voltage ramp complete and current below 130% motor FLA): One Form A

2.2 Protection: A microprocessor-controlled thermal protection system shall be included that continuously calculates the temperature rise of the motor and soft start, and provides the following:

1. An overload pre-alarm, which indicates by relay contact that the motor has exceeded its rated temperature rise by 10%.

2. A thermal fault condition that stops the motor if the temperature rise exceeds 120% of the motor thermal capability.

3. The soft start shall provide phase loss, phase reversal, underload, stall and jam protection.

2.3 Control Options

1. The peripheral soft start control circuitry shall be operated at 120Vac, 60 Hz from a control power transformer included within the enclosure.

2. Operator devices shall be mounted on interior swing out door and shall be the following:

   a. Three position H-O-A switch that provides for manual (hand) start or remote signal (automatic) start from user supplied relay contacts.
   b. Red off pilot light illuminated whenever the soft start is supplied with control power and no run command is present
   c. Green on pilot light illuminated whenever the soft start is provided a run command and no fault condition is present

3. Startup: The services of a qualified manufacturer's technical representative shall be available to install, test, and start up all soft starts furnished under this specification.

3. Phase Monitor:

   a. Equip panel to monitor incoming power and shut down pump when required to protect motor from damage caused by phase reversal, phase loss and voltage imbalance.
   b. Motor shall automatically restart when power conditions return to normal.

4. Control Power Transformer: Required for 3 phase, 3-wire incoming power supplies only.

   a. Open core and coil type, fused primary and secondary.
   b. Properly sized for connected load, 3 KVA minimum.
   c. External mount to prevent excessive heat in panel enclosure.

5. Ventilation:

   a. Equip panel with intake and exhaust louvers and fan to minimize effects of excessive heating.
   b. Louver positions and fan size as recommended by control panel manufacturer.

6. Pump Selection Mode:

   a. Provide UL rated, heavy duty, oil-tight "Off-On" selector switch for each motor.
   b. "On" position not to override motor overload shutdown.
   c. Provide device to permit manual adjustment of motor speed.

7. Elapsed Time Meter:

a. Equip panel with elapsed time meter for each pump motor.

b. Connect to each motor starter to indicate total running time.

c. Six-digit, non-resettable type reading in hours and tenths of hours.

d. Mount in inner panel swing door.

8. Pilot Lights: Equip panel with UL rated, heavy duty, oil-tight pilot light indicators for each pump as follows:

   a. Run, green light.

   b. Off, Red light.

   c. Seal Failure, amber light.

9. Lugs and Terminal Blocks:

   a. Provide tin- or silver-plated copper lugs for connection of incoming power supply and pump power leads.

   b. Provide terminal blocks suitable for use with locking fork or ring tongue connectors for control inputs/outputs.

   c. Mount lugs and terminal blocks to allow wire bending space in accordance with NEC.

   d. Locate such that no field wiring will cross factory wiring.

10. Wiring:

    a. Control panel shall be completely factory wired, except for field connections. All wiring, workmanship, and schematic wiring diagrams shall conform to applicable NEC standards.

    b. All user serviceable wiring shall be type THHN/THWN, 600 volts, stranded copper, color coded as follows:

       1) Line and Load Circuits, AC or DC power ..... Black
       2) AC Control Circuits Less Than Line Voltage..... Red
       3) DC Control Circuits.....Blue
       4) Equipment Grounding Conductor.....Green
       5) Current Carrying Ground.....White
       6) Hot with Circuit Breaker Open.....Orange

    c. Wire Identification and Sizing:

       1) Control circuit wiring inside panel, except internal wiring of individual components, shall be 14 gauge minimum. Power wiring shall be 12 gauge minimum.

       2) Wires shall be clearly numbered at each end in accordance with the schematic wiring diagram.

    d. Wire Bundles:

       1) All internal wiring shall be neatly routed in bundles and tied in accordance with good commercial practice.

       2) Bundles routed to components mounted on inner swing panel shall be made flexible at the hinged side. Provide adequate length and flex to allow swing panel to fully open without undue stress or abrasion on the wire or insulation. Secure bundles in place on each side of hinge with mechanical fastening devices.

e. Schematic Wiring Diagrams:

1) Provide a laminated electrical schematic diagram of the pump controls including terminal block connections.

2) Permanently mount on the inside of the enclosure door.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION

A. The Contractor shall furnish and deliver to the site in new and unused condition the submersible raw sewage pumps, lifting system, and appurtenant equipment.

B. Equipment shall be installed in strict compliance with the manufacturer's instructions to yield optimum efficiency and reliability.

C. Pumping equipment and appurtenances shall be installed as indicated and in accordance with the manufacturer's written instructions.

3.2 FIELD TESTING

A. Manufacturer's Services:

1. The equipment manufacturer shall furnish the services of a qualified factory-trained field service engineer for two 8-hour working days at the site to inspect the installation and to instruct the Owner's personnel in the operation and maintenance of the pumps.

2. Services to be performed by an authorized representative of the pump manufacturer.

3. The pump manufacturer shall furnish the Owner with a written warranty to cover the pump(s) and motor(s) against defects in workmanship and material for a period of five (5) years or 10,000 hours of operation under normal use and service.

4. The pump manufacturer will pay the following portion of the cost of all replacement parts and repair labor from the date of shipment of the pump unit. Pumps repaired under warranty will be returned to the owner freight prepaid.

Months	0-18	19-39	40-60
Hours	0-3,000	3,000-6,500	6,500-10,000
Warranty	100%	50%	25%

5. The warranty shall be in printed form and previously published as the manufacturer's standard warranty for all similar units manufactured.

B. Operational Test:

1. Each pump shall be individually tested in the field with potable water to determine conformance with the published head discharge curve for that pump.

2. A pressure gauge shall be attached to the discharge side of each pump to determine pressure discharge relationships.

3. The valve on the discharge side of the pumps shall be utilized for throttling purposes, with wet well volume used as an indicator of water flow rate.

4. Contractor shall supply water for testing, and pressure gauge, and shall conduct pump test in the presence of the Engineer.

END OF SECTION 444629.13

APPENDIX "1"

LAND DISTURBANCE STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

FOR CONSTRUCTION OF:

Connect Camp Clark Sewer System To City Of Nevada Sewer System
Nevada, Missouri

Prepared for

Missouri National Guard
Nevada, Missouri

February 2024

Prepared by:

ALLGEIER, MARTIN and ASSOCIATES, INC.
Consulting Engineers • Hydrologists • Surveyors
Joplin, Kansas City, Rolla, Springfield, Missouri

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Appendices

I. SITE DESCRIPTION

Project Location – Land disturbance activities will take place at Camp Clark National Guard Training Site, Nevada, Missouri and include land disturbing activities for renovation and construction of campsites. Construction will take place within Section 18 of Township 35 north, Range 30 west, Section 13 of Township 35 north, Range 31 west, and Section 12 of Township 35 north, Range 31 west. Drainage from the site will be directed along a swale to the east end of the campground. Generally only one outfall, Outfall 001, will be associated with this project and it is located in the Northwest ¼ of the Northwest ¼ of Section 18, Township 35 north, Range 30 west. Refer to the location map on the Erosion Control Plan.

Project Owner – State of Missouri National Guard
2302 Militia Drive
Jefferson City, Missouri 65101

Total Anticipated Disturbed Area = 4.82 acres

II. SEQUENCE OF CONSTRUCTION ACTIVITIES

The project shall be constructed per the plans and specifications. Prior to the initial soil disturbance activities, temporary BMPs shall be installed at the locations shown on the Erosion Control Plan Drawing in order to retain sediment on the site and out of the drainage structures and streams. Additional Temporary BMPs shall be installed as site-specific conditions may require.

The proposed general sequence of construction activities is as follows:

1. Establish the construction entrance/exit drive(s) as needed at any location(s) as determined by the contractor in the field. Stabilize and maintain the construction entrance/exit drive(s) with a minimum 6" thick layer of 3" to 5" clean, washed and graded, crushed stone, placed over a geotextile filter material, for control of vehicle tracking of sediments off-site and onto the public roadways.

2. Removal of any trees and/or vegetation, as needed, for the installation of all temporary BMP's. Soil disturbances shall be minimized during this process.

3. Placement of filter fabric silt fencing, filter rolls, straw bale barriers/straw wattles, rock check dams, and inlet/outlet protection as required, at the locations shown on the Erosion Control Plan Drawing, and any other additional areas where site conditions may require to prevent erosion and sediment losses with storm water runoff from the site during the earthwork activities. Installation of these items shall be accomplished prior to, and during the turf and soil disruptions caused by the excavation, filling, grading, trenching, and construction activities.

4. Clear and grub all areas as required for the construction of the proposed improvements, as shown on the construction drawings. Existing vegetation shall be preserved wherever practical.

5. Relocation of and/or installation of additional BMPs shall be accomplished as required to accommodate construction and reduce sediment loss.

6. Grade, shape, and prepare seedbed of all disturbed areas, as required by the plans and specifications that have been impacted by the improvements.

7. Following seedbed preparation of disturbed areas, apply seed, fertilizer, mulch, etc. in areas where final construction has been completed, and maintain until permanent vegetation is re-established per this SWPPP, and in compliance with the conditions of the Storm Water Discharge General Permit issued by the Missouri Department of Natural Resources (MDNR).

8. Temporary seeding and mulching of disturbed areas shall be performed, as necessary, to prevent erosion and sediment loss during the construction activities prior to permanent seeding of the disturbed areas.

Best Management Practices (BMPs) including establishment of the rock stabilized construction entrance/exit(s), placement of filter fabric silt fence, filter rolls, any straw bale silt barriers, rock check dams, inlet/outlet protection, temporary seeding and any other measures to prevent erosion of the soils and sediment movement off-site shall be implemented prior to the land disturbance activities. Inspection, maintenance, repair, and upkeep of all BMPs throughout the construction project to achieve compliance with the conditions of the National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permit issued by the MDNR, and this SWPPP is, and will be, considered a major concern and part of the project. All conditions of the NPDES permit and this SWPPP shall be strictly adhered to throughout the project, as required.

III. POLLUTION CONTROL – BEST MANAGEMENT PRACTICES (BMPs)

1. Erosion and Sediment Abatement Control

A. Soil Stabilization Practices

1) Temporary Practices: Topsoil stockpiles and areas of the project where daily construction activities will temporarily cease for longer than 21 days shall be stabilized using silt fencing, or covered to prevent erosion within 14 days. The contractor shall cause the location of topsoil stockpile to be noted and indicated on the Erosion Control Plan Drawing.

2) Permanent Restoration: Disturbed portions of the site area affected by the construction shall be seeded for permanent vegetative restoration of turf per the contract plans and specifications. All areas disturbed during construction shall be fertilized, seeded, and mulched.

Erosion Control Mat – Biodegradable erosion control mats shall be installed (as needed) along steeper slopes, bottom of ditches, and elsewhere if shown on the Erosion Control Plan drawing and/or as needed, or as directed by the Resident Project Representative in accordance with the manufacturer's instructions. The mats shall be constructed with straw or recycled cellulose products and strengthened with a netting of polypropylene or natural fibers. Mats shall have a recommended life of at least ten months. Contractor shall apply fresh seed prior to placement of the erosion control mats.

Slopes and seedbed areas shall be properly prepared, fertilized and seeded prior to installation of the mats. Mats shall be anchored with hardwood or biodegradable pins in accordance with the manufacturer's recommendations. Metal pins are not acceptable and shall not be used.

Erosion control mats shall be S150BN manufactured by North American Green or an approved equal.

B. Structural Element Practices

1) Filter Fabric Silt Fence and Filter Rolls: Temporary filter fabric silt fencing and/or filter rolls shall be installed along and downgradient of the disturbed areas as shown on the SWPPP drawing and in additional areas as needed, prior to and in conjunction with the construction of the improvements. The placement of the silt fencing and filter rolls shall be effective in the prevention of major sediment movement from the site. All filter fabric silt fencing and filter rolls shall be maintained throughout the construction and until final vegetation is restored.

2) Straw Bale Barrier: Temporary straw bale barriers shall be strategically placed at the site as shown on the Erosion Control Plan drawing and at additional locations as necessary according to site specific terrain requirements, as a control measure to contain and prevent major sediment runoff from the project site as needed.

3) The construction entrance/exit drive(s) shall be rock stabilized with a minimum 6" thick, 3" to 5" crushed stone over a geotextile filter material to prevent construction vehicles from transporting, tracking and/or dropping sediment onto public roadways, as needed. All established entrance/exit drive(s) on/site shall be kept clear and clean of any and all sediment to prevent tracking to public roads. This may require daily sweeping.

4) Inlet Protection: Temporary measures, such as gravel filter bags/rolls, silt fence, sod, etc., shall be installed on the upstream side of all culverts and around all curb or yard inlets, to trap sediment. This mechanism prevents the sediment from entering inlet structures and prevents the silting-in of inlets, storm drains, culverts, and/or receiving channels.

5) Outlet Protection: Temporary or permanent measures shall be installed at all culvert or storm drain outlets as shown on the plans or as determined by site specific conditions, to reduce the speed of concentrated storm water flows thereby reducing erosion. Types of outlet protection include, but are not limited to, stone rip-rap, concrete aprons, paved sections, and/or settling basins.

6) Rock Check Dams: Temporary rock check dams shall be installed within defined drainage ditches as shown on the drawings or as site specific conditions dictate, to reduce the speed of concentrated storm water flows thereby reducing erosion. Rock check dams shall not exceed 2 feet and the top of dam shall be at least 1 foot below the top of ditch or channel. The top width of the dam shall be 2 feet wide with 3:1 side slopes.

2. <u>Waste Disposal</u>

A. Construction Waste/Trash/Solid Waste: Any and all waste materials (except hazardous waste–see paragraph III.2.B.) generated during the project shall be collected as needed and removed from the site daily or placed and stored in a metal dumpster rented from a solid waste management company licensed to operate in Barry County, Missouri or owned by the contractor or the owner. The dumpster(s) shall meet all local and State solid waste management regulations. The contractor shall cause the location of solid waste containers placed on the site to be noted and indicated on the Erosion Control Plan drawing. All trash and construction debris from the site will be deposited in the dumpster(s) as appropriate. The dumpster(s) shall be emptied approximately once per week, or more often if necessary. No construction waste materials shall be buried on site. All brush, trees and refuse shall be removed or disposed of by burning (if permitted). Materials such as tires or waste oil may not be used to start the fires or be burned in the fires. Missouri State Regulations prohibit open burning of any waste generated by a business, trade, industry, or any demolition operation including, but not limited to paper, cardboard boxes, pallets, tires, rubber products, hazardous materials, styrofoam, plastics, petroleum products, treated wood and any asbestos-containing material. Any burning operations shall be in strict compliance with the requirements of all applicable statutes and regulations. Prior to conducting any open burning, the contractor shall contact the appropriate city or county of jurisdiction for any local restrictions or permit requirements. Burning operations shall not constitute a nuisance to persons living nearby, shall be kept away from all property lines and at least 200 yards from the nearest inhabited dwelling, as well as transmission and distribution lines and shall be carefully controlled to prevent any damage to adjacent properties and facilities. Burn pit refuse shall be cleaned out and disposed of off-site. All personnel shall be instructed regarding the correct procedure for waste disposal. Notices stating these practices will be posted on site, as necessary. The

contractor shall cause any and all burning locations to be shown on the Erosion Control Plan drawing.

B. Hazardous Waste: Any and all hazardous waste materials shall be disposed of in the manner specified by local, State and/or Federal regulations, or according to manufacturer specific instructions. Site personnel shall be instructed in these practices, and the individual who manages day-to-day site operations will be responsible for seeing that these practices are followed.

C. Sanitary Waste: The General Contractor is responsible for providing sanitary facilities, as needed, should use of any permanent facilities not be available. The contractor shall cause the location of portable toilet facilities to be noted and indicated on the Erosion Control Plan drawing. All sanitary waste will be collected from the portable units (if provided) a minimum of one time per week (or as needed) by a licensed sanitary waste management contractor, or as required by local regulation and disposed of only in locations having a State permit.

3. <u>Offsite Vehicle Tracking</u>

A. A stabilized construction site entrance/exit drive(s) shall be established and maintained to help reduce tracking of any sediment off-site and onto the adjacent and adjoining roadways. Care shall be taken to ensure that adequate rock aggregate is in place at all times at the entrance to minimize offsite tracking as discussed previously Section III.1.B.3 of this SWPPP.

IV. MAINTENANCE/INSPECTION PROCEDURES

1. Inspection Schedule

A. All control measures **SHALL** be inspected at least once a week, or as required by the issued storm water discharge permit, prior to a known major storm event, and within a reasonable time, not to exceed 24 hours, following any storm event of 0.5 inches or greater. The contractor is responsible for completing all inspection and maintenance forms, and providing same to the owner.

2. Maintenance of Sediment Control Measures

A. All storm water runoff sediment control measures shall be maintained in good working order. Maintenance and repair (if necessary) shall be initiated within 24 hours of being reported.

B. Sediment built up shall be removed from the filter fabric silt fence barriers or filter rolls when it has reached one-third the height of the barrier or sooner.

C. All filter fabric silt fences and filter rolls shall be inspected for depth of sediment and for fabric tears and to ensure the fabric is securely attached to the fence posts or stakes, and that the fence posts or stakes are firmly in the ground.

D. Any and all earthen berms and sedimentation basin dams shall be inspected for damage and erosion and repaired if necessary.

E. Any and all vegetative buffers or rock check dams shall be replenished or replaced when the void space has become filled with silt and sediment to the point it is no longer functional.

F. Straw bales shall be inspected for damage and anchor integrity and replaced and/or re-anchored, if necessary. Sediment built up shall be removed from the straw bale barriers when it has reached one-third the height of the barrier or sooner, as required.

G. All temporary seeding shall be inspected for bare spots, washouts, and healthy growth. Re-seeding will be accomplished as necessary.

H. A maintenance inspection report shall be completed during each inspection. Copies of the inspection and report forms to be completed by the inspector are included at the end of this section.

I. The contractor will be responsible for inspections, completion of the inspection and maintenance reports, and all maintenance and repair activities. The contractor shall provide the owner with copies of all required reports in a timely manner.

J. The contractor shall name an individual as the Environmental Manager for the site for inspection and maintenance responsibilities. The individual shall be trained and knowledgeable in all the inspection and maintenance practices necessary for keeping the erosion and sediment controls (BMPs) used on the site in good working order. The contractor shall cause the name of the Environmental Manager to be to be noted and indicated in the space provided on the Erosion Control Plan drawing.

3. Non-Storm Water Discharges

A. It is expected the following non-storm water discharges may occur from the site.

1) Wash waters from construction equipment and finished pavement (where no spills or

leaks of toxic or hazardous materials have occurred.)

2) Water sprinkling for dust control.

V. SPILL PREVENTION - SITE MANAGEMENT BMPs/MMPs

The following are the material management practices (MMPs) that will be used to reduce the risk of spills or other accidental exposure of materials and substances to storm water runoff.

1. Good Housekeeping Practices

A. The contractor shall make a concerted effort to store only enough of each product on site required to do the job. The contractor shall cause the location of storage areas on the site to be noted and indicated on the SWPPP drawing.

B. Any and all materials stored on site shall be stored in a neat, orderly manner in their appropriate containers and, if possible, under a cover or other enclosure for protection from precipitation and located away from drainage courses and low areas.

C. Any and all materials and products shall be stored and maintained in their original containers with the original manufacturer's label.

D. Substances shall not be mixed with one another unless recommended by the manufacturer.

E. Whenever possible, all of a product shall be used up before disposing of the container.

F. Manufacturers' recommendations for proper use and disposal shall be followed at all times for all materials and products.

G. The contractors' site superintendent, or his designated appointee, shall visually inspect the job site daily to ensure proper use and/or disposal of all materials on site.

2. Hazardous Products - Storage, Handling, Use, & Disposal Practices

The contractor shall cause the location of any and all hazardous materials/hazardous products placed on the site to be noted and indicated on the SWPPP drawing. These practices are used to reduce the risks associated with hazardous materials:

A. Any and all products shall be kept in original containers unless they are not re-sealable. Otherwise they should be transferred to re-sealable containers for storage and properly marked, indicating the contents.

B. Original labels and material safety data sheets (MSDSs) shall be retained on site, as they contain important product information.

C. If surplus product must be disposed of, manufacturers' and local, State and Federal recommended methods for proper disposal shall be followed.

D. Fuels, oils, lubricants, solvents, or other hazardous materials shall NOT be disposed of on site. All hazardous material must be properly stored, used, and disposed of in accordance with State and Federal laws and regulations. Drip pans shall be provided for any valves on storage containers, as appropriate. For further guidance, contact MDNR at 1-800-361-4827.

3. Product Specific Practices

The following product specific practices shall be followed on site:

A. Petroleum Products: All on-site vehicles and equipment shall be monitored for leaks, and shall receive regular preventive maintenance to reduce the chance of leakage. Any and all petroleum products on site shall be stored in tightly sealed containers that are clearly labeled and provided with drip pans, if appropriate. Any asphalt substances used on site shall be applied according to the manufacturer's recommendations. Any fuel storage tanks located on-site shall be provided with adequate secondary containment. Drip pans shall be provided for all valves. If greater than 1,320 gallons of oil is stored on the site, the contractor is responsible for providing and maintaining a SPCC (Spill Prevention, Control, and Countermeasures) plan on site. The contractor shall cause the location of any petroleum product storage areas on the site to be noted and indicated on the SWPPP drawing.

B. Fertilizers: Fertilizers shall be applied only in the minimum amounts stated in the project specifications. Once applied, fertilizer shall be worked into the soil to limit exposure to storm water. Storage of fertilizer shall be inside or under cover. The contents of any partially used bags of fertilizer shall be transferred to a properly labeled, sealable plastic bin or container to avoid spills. The contractor shall cause the location of any fertilizer product storage area on the site to be noted and indicated on the SWPPP drawing.

C. Paints/Solvents/Cleaning Compounds, Etc.: All containers shall be tightly sealed and stored when not required for use. Drip pans shall be provided, if appropriate. Excess materials shall NOT be disposed or dumped on site, but shall be properly disposed of according to manufacturer's instructions and/or Federal, State, and local regulations. The contractor shall cause the location of any storage areas on the site containing paints/solvents/cleaning compounds, etc. to be noted and indicated on the SWPPP drawing.

D. Concrete Trucks: Concrete trucks shall be allowed to wash out only in locations where the discharge will remain on-site, and in a manner that prevents contact with storm water runoff. It is not permissible to discharge concrete truck washout directly to streams or storm drains.

E. Mud/Sediment Offsite Tracking: Only the designated entrance(s) shall be used for contractor access to, and exit from, the site. The General Contractor shall be responsible for keeping all mud and off-site tracking cleaned from the adjoining public road, on a daily basis if needed.

4. Spill Control Practices

The contractor is responsible for providing and maintaining a SPCC (Spill Prevention Control and Countermeasures) plan on site, as required by the regulations at 40 CFR 112. In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices shall be followed for spill prevention and cleanup:

A. Manufacturer's recommended methods for spill cleanup shall be clearly posted, and site personnel shall be made aware of the procedures and the location of the information and cleanup supplies. Refer to manufacturer's MSDSs.

B. Materials and equipment necessary for spill cleanup shall be kept in a designated material storage area on site. The contractor shall cause the location of the spill cleanup materials and equipment to be noted and indicated on the SWPPP drawing. Spill cleanup equipment and materials shall include, but not be limited to, shovels, brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and/or metal trash containers specifically for this purpose, as applicable.

C. All spills shall be cleaned up immediately after discovery and properly containerized for proper disposal. Burial on site is not acceptable and shall not be allowed.

D. The spill area shall be kept well ventilated and personnel shall wear appropriate protective

clothing to prevent injury from contact with a hazardous substance.

E. Reportable quantities for spills of toxic or hazardous material shall be promptly reported to the appropriate Federal, State and local government agencies, as required, including those listed on the enclosed "Spill/Release Information and Reporting Form". Reportable quantities for oil and hazardous substances are found at 40 CFR 110, 117, and 302, and as stated in the Appendix of this plan. When permits are applicable, the permittee or his/her authorized representative is required to notify the MDNR Environmental Emergency Response in accordance with 40 CFR 117 and 40 CFR 302 as soon as they have knowledge of the discharge of any hazardous substance or petroleum product in excess of the reportable quantity. The MDNR emergency spills hot line is 1-573-634-2436. Copies of any and all reporting forms shall be provided to the owner of the project as soon as is practical.

F. The spill prevention, control and countermeasures plan and/or practices shall be adjusted to include measures to prevent a spill event of this type from recurring, and how to clean up the spill if there is another one. A description of the spill, what caused it, and the cleanup measures taken shall also be included.

G. The Environmental Manager shall also be the spill prevention and cleanup coordinator unless the contractor arranges otherwise. He shall designate other site personnel who shall receive spill prevention and cleanup training, as required. The names of responsible spill personnel shall be posted in the material storage area and in the office trailer on site, if one so exists.

VI. AIR EMISSIONS

1. Burning: Any burning on the site may require a permit from the MDNR. For guidance, contact the MDNR Kansas City Regional Office at (816) 622-7000 or the MDNR Air Pollution Control Program, Jefferson City at (573) 751-4817. County and/or City ordinances may also apply. It is the responsibility of the contractor to contact these governing bodies for guidance. Refer to Section III.2.A of this SWPPP for additional information relative to open burning at the site. An MDNR fact sheet relative to open burning is included at the end of this section.

2. Dust Control: The contractor is required by State law to control fugitive dust blown from the site. Dust can be minimized by stabilizing areas with mulch as soon as possible. Watering should be provided in unstabilized areas as needed for dust control. Contact MDNR for guidance, as needed, at the numbers listed above.

VII. AMENDING THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

The permittee, State of Missouri National Guard, and the Contractor shall amend and update the SWPPP, as appropriate, during the term of the land disturbance activities. The permittee/contractor shall amend the SWPPP, at a minimum, whenever the:

1. Design, operation, or maintenance of Best Management Practice (BMP) structures and/or controls is changed or is deemed inadequate in controlling sediment;

2. Changes in the design of the project that could significantly affect the quality of the storm water discharges;

3. Inspections indicate deficiencies in the SWPPP or any BMP used at the site;

4. MDNR notifies the permittee of deficiencies in the SWPPP;

5. The SWPPP is determined to be ineffective in significantly minimizing or controlling erosion and off-site sedimentation (e.g., there is visual evidence, such as excessive site erosion or excessive sediment deposits in receiving streams);

6. Non-Filterable Residues (NFR) from a storm water outfall exceeds 45 mg/l;

7. Total Settleable Solids from a storm water outfall exceed 2.5 ml/L/hr, unless the disturbed area is defined under, "Applicability to Valuable Resource Water". Settleable Solids from a storm water outfall in areas near Valuable Resource Water shall not exceed 0.5 ml/L/hr, as indicated in the permit issued by MDNR and/or;

8. MDNR determines violations of Water Quality Standards may occur or have occurred.

Based on the results of an inspection, the SWPPP must be modified as necessary to include additional or modified BMPs designed to correct problems identified. Revisions to the SWPPP must be completed within seven (7) calendar days following the inspection. Implementation of these additional or modified BMPs must be accomplished as soon as possible.

VIII. RETENTION OF RECORDS

The permittee, State of Missouri National Guard, shall retain copies of the SWPPP and all reports required by this permit, and records of all data used to comply with this permit, for a period of at least three years from the date that the site is finally stabilized. This period may be extended by request of the Director of MDNR at any time.

The permittee shall retain a copy of the SWPPP from the date of project initiation to the date of final stabilization, as required by the permit (including a copy of the permit), at the construction site (or other local location), and made available upon request by the MDNR Director, or his representative; or other State or local agency approving or inspecting sediment and erosion control plans, grading plans, or storm water management plans to ensure implementation of the SWPPP, or the operator of a municipal separate storm sewer system, if any, receiving discharges from the site; and representatives of the U.S. Fish and Wildlife Service or the National Marine Fisheries Service. The Permittee, or Contractor(s) with day-to-day operational control over SWPPP implementation shall have a copy of the SWPPP on-site or locally available at all times. A copy of the SWPPP, in its entirety, must be made available to the MDNR staff for review and copying at the time of an on-site inspection. All SWPPPs must be signed and certified, as required.

If an on-site location is unavailable to store the SWPPP when no personnel are present, a sign or other notice of the plan's location must be conspicuously posted near the main entrance of the construction site. If not feasible, the notice can be posted in a local public building, or public library. The sign or other notice must contain the following information:

1) A copy of the completed Application, as submitted to the MDNR Water Pollution Control Program; and

2) If the location of the SWPPP or the name and telephone number of the contact person for scheduling SWPPP viewing times has changed, the current location of the SWPPP and the name and telephone number of the person for scheduling viewing times must be stated.

CONNECT CAMP CLARK SEWER SYSTEM TO CITY OF NEVADA SEWER SYSTEM
CAMP CLARK NATIONAL GUARD TRAINING SITE, NEVADA, MO
PROJECT No. T2301-02

OWNER'S CERTIFICATION

I certify that, being an authorized representative of State of Missouri National Guard, owner of the site, the information contained herein is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting (if required) false information, including the possibility of fine and imprisonment for knowing violations.

Printed Name:_____

Title:_____

Signature:_____

Date:_____

For: State of Missouri National Guard
2302 Militia Drive
Jefferson City, Missouri 65101

CONTRACTOR'S CERTIFICATION

I certify under penalty of law, that I, being an authorized representative of the Contractor for the permittee, understand the terms and conditions of the National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge General Permit issued by the Missouri Department of Natural Resources (MDNR) and this Storm Water Pollution Prevention Plan (SWPPP) and shall comply with all conditions of the SWPPP, and the Permit for authorized Storm Water Discharges Associated with Construction or Land Disturbance Activities as issued by the MDNR Water Pollution Control Program, and that any non-compliance with the general permit constitutes a violation of Chapter 644, Missouri Clean Water Law, and 10 CSR 20-6.200. Non-compliance may result in enforcement action, termination of this authorization, or denial of the permittee's request for renewal.

_____
Printed or Typed Name and Title

_____
Contractor's Representative Signature Date

For: _____
Contractor Name (Print)

_____
Contractor Address

_____
City/State

CONNECT CAMP CLARK SEWER SYSTEM TO CITY OF NEVADA SEWER SYSTEM
CAMP CLARK NATIONAL GUARD TRAINING SITE, NEVADA, MO
PROJECT No. T2301-02

INSPECTION AND MAINTENANCE REPORT FORM
TO BE COMPLETED AT LEAST ONCE PER WEEK, PRIOR TO A KNOWN MAJOR STORM EVENT, AND WITHIN 24 HOURS OF A 0.5 INCH OR MORE RAINFALL EVENT

INSPECTOR: _____ DATE: _____
DAYS SINCE LAST RAINFALL: _____ AMOUNT OF THIS RAINFALL _____ INCHES

Storm Water Control (If applicable)	Condition	Repair Req'd		Comments (Attach additional Sheets if Necessary)	Date Repaired	Initials
		Yes	No			
Site Entrance/Exit(s)						
Filter Fabric Fences						
Straw Bales						
Seeded Areas						
Top Soil Stockpile(s)						
Material Storage Areas						
Portable Toilet(s)						
Waste Container(s)						
Fuel Storage						
Outfall #001						
Outfall #002						

STABILIZED CONSTRUCTION SITE ENTRANCE/EXIT(S)

Does Sediment Get Tracked on to Road?	Is the Rock Clean or is it Filled with Sediment?	Does All Traffic Use the Stabilized Entrance to Enter and Leave the Site?	Is the Culvert (if installed) Beneath the Entrance Working?

Describe Maintenance Required to the Stabilized Construction Entrance/Exit(s): _____

_____

_____

_____

Continued on Next Page

SEDIMENTATION BASIN(S)

Depth of Sediment Basin	Condition of Basin Side Slopes	Any Evidence of Overtopping of the Embankment	Condition of Outfall from Sediment Basins
N/A			

Describe Maintenance Required for the Sedimentation Basins: _____

_____

□ If this box is checked, I hereby certify that this inspection did not identify any incidents of non-compliance and that the facility is in compliance with the permit and the SWPPP.

CERTIFICATION:

Qualified personnel must conduct all inspections. "Qualified Personnel" means a person knowledgeable in the principles and practice of erosion and sediment controls who possesses the skills to assess conditions at the construction site that could impact storm water quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of storm water discharges from the construction activity. I certify under penalty of law that I am qualified to properly gather and evaluate the information submitted and that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for known violations.

Signature: _____ Date: _____

Printed Name: _____ Contractor: _____

Address: _____ City/State: _____

All Maintenance Items Required and Described above are:

To be performed by: _____ On or Before: _____

Signature: _____ Date: _____

Date Repaired: _____ By: _____

List of Items Repaired: _____

_____

_____

Signature: _____ Contractor: _____

Printed Name: _____ Date: _____

CONNECT CAMP CLARK SEWER SYSTEM TO CITY OF NEVADA SEWER SYSTEM
CAMP CLARK NATIONAL GUARD TRAINING SITE, NEVADA, MO
PROJECT No. T2301-02

INSPECTION AND MAINTENANCE REPORT FORM

CERTIFICATION:

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

Signature: _____ Date: _____

Printed Name: _____ Phone: _____

Contractor: _____ Address: _____

City/State: _____

Report Submitted to and Received by Owner (Permittee), State of Missouri National Guard.

Date: _____

Submitted by: _____
Printed Name – Contractor's Representative

Signature: _____

Contractor: _____

Date: _____

Received by: _____
Printed Name – State of Missouri National Guard

Signature: _____

NOTE: All inspection and maintenance report forms shall be retained by the owner for at least three years from the date the site is finally and permanently stabilized, and permit coverage expires or is terminated. This period may be extended by the request of MDNR at any time.

# of additional sheets attached = _____

CONNECT CAMP CLARK SEWER SYSTEM TO CITY OF NEVADA SEWER SYSTEM
CAMP CLARK NATIONAL GUARD TRAINING SITE, NEVADA, MO
PROJECT No. T2301-02

INSPECTION LOG SHEET

REGULARLY SCHEDULED INSPECTIONS SHALL BE AT A MINIMUM OF ONCE PER WEEK, PRIOR TO A KNOWN MAJOR STORM EVENT, AND WITHIN 24 HOURS OF A 0.5 INCHES OR MORE RAINFALL EVENT

DATE OF INSPECTION	ANY BMPs NEED MAINTENANCE? YES/NO	INSPECTORS NAME

Note: To be completed along with each INSPECTION AND MAINTENANCE REPORT

CONNECT CAMP CLARK SEWER SYSTEM TO CITY OF NEVADA SEWER SYSTEM
CAMP CLARK NATIONAL GUARD TRAINING SITE, NEVADA, MO
PROJECT No. T2301-02

CONSTRUCTION SITE WEATHER INFORMATION DATA

DATE	PRECIPITATION START TIME	PRECIPITATION END TIME	AMOUNT (INCHES)	DISCHARGE AT OUTFALLS? YES (#) / NO	INITIALS

Date: _____ Date: _____

Submitted by: _____ Received by: _____
Printed Name – Contractor Representative Printed Name – Owner Representative

Signature: _____ **Signature:** _____

CONNECT CAMP CLARK SEWER SYSTEM TO CITY OF NEVADA SEWER SYSTEM
CAMP CLARK NATIONAL GUARD TRAINING SITE, NEVADA, MO
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CHANGES REQUIRED TO THE SWPPP

CHANGES REQUIRED: _____

_____

_____

_____

_____

REASONS FOR CHANGES: _____

_____

_____

_____

_____

Date Changes Made to SWPPP: _____

Date Changes Implemented at the Site: _____

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

Number of Additional Pages Attached: _____

Printed Name: _____ Company: _____

Signature: _____ Date: _____

Date Received by State of Missouri National Guard: _____

Received by: _____ Signature: _____
Printed Name – Owner Representative

CONNECT CAMP CLARK SEWER SYSTEM TO CITY OF NEVADA SEWER SYSTEM
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LIST OF STABILIZED AREAS

DESCRIPTION OF AREA WHERE FINAL STABILIZATION HAS BEEN ACHIEVED	DATE STABILIZED /INITIALS

INITIALS _____ **NAME**_____

INITIALS _____ **NAME**_____

CONNECT CAMP CLARK SEWER SYSTEM TO CITY OF NEVADA SEWER SYSTEM
CAMP CLARK NATIONAL GUARD TRAINING SITE, NEVADA, MO
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MAJOR GRADING ACTIVITIES REPORT

GRADING START DATE	GRADING END DATE	LOCATION ¼, ¼, SECTION, TWP, RGE or AREA DESCRIPTION	STABILIZATION MEASURES INITIATED YES/DATE ---------NO

Date: _____ Date: _____

Submitted by: _____ Received by: _____
Printed Name – Contractor Printed Name – Owner's Representative

Signature: _____ Signature: _____

CONNECT CAMP CLARK SEWER SYSTEM TO CITY OF NEVADA SEWER SYSTEM
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SPILL/RELEASE INFORMATION AND REPORTING FORM

1. Basic description of the spill/release, including causes, if known: _____

_____

_____

_____

_____

(If additional space is required, attach additional sheets.)

2. Chemical Name of Material Spilled: _____
3. Listed CERCLA Hazardous Substance? Yes ___ No ____
4. Listed EPCRA Extremely Hazardous Substance? Yes ___ No ____
5. Oil? Yes ___ No ____
6. Quantity Spilled (exclude water): _____
7. Date and Time of Spill: _____
8. Duration of Spill: _____
9. Spill Went to: Water: _____ Land: _____ Air: _____
10. Any known or anticipated acute or chronic health risks associated with the spill and, where appropriate, advice regarding medical attention necessary for exposed individuals.

_____

_____

_____

11. Proper precautions to take as a result of the release, including evacuation (unless such information is readily available to the community emergency coordinator pursuant to the emergency plan).

_____

_____

_____

12. Spill Reported By: _____

    Date: _____

    Spill Reported to: _____

_____

_____

REPORTABLE QUANTITIES FOR OIL
AND HAZARDOUS SUBSTANCES ARE FOUND AT
40 CFR Part 110, 40 CFR Part 117, & 40 CFR Part 302

In accordance with the Missouri Department of Natural Resources (MDNR), Division of Environmental Quality, a Release and a Reportable Release of Petroleum Products are defined as follows:

Release: Any loss of petroleum product to the environment is considered a release. This definition includes, but is not limited to, any spilling, leaking, emitting, discharging, escaping, leaching, or disposing from a storage tank into ground water, surface water, surface or subsurface soils.

Reportable Release: A petroleum product release greater than fifty (50) gallons, or spills and/or overfills of petroleum product from an underground storage tank that result in a release to the environment that exceeds twenty-five (25) gallons, or any release that causes a sheen on nearby surface water; and a spill or overfill of a hazardous substance that results in a release to the environment that equals or exceeds its reportable quantity under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980 is a reportable release and must be reported to the MDNR within twenty-four (24) hours. Soil contamination levels of TPH ≥ 50 parts per million (ppm), BTEX ≥ 1.0 ppm, benzene ≥ 0.5 ppm, or MTBE ≥ 60 ppm is also considered to be evidence of a reportable "release" of petroleum products.

Formal reporting of a Reportable Release shall be as follows:

MDNR – Environmental Emergency Response Unit – (573) 634-2436 (Follow MDNR instructions)
National Response Center – 1-800-424-8802
MDNR – Jefferson City – (573) 751-3176
Cassville Fire Protection District - Emergency 911 – Non-Emergency 417-846-4005

All spills reported by telephone shall be reported in writing within 24 hours by the responsible party, and submitted to the MDNR Environmental Emergency Response Unit, or as directed by the Agency, with copies submitted to State of Missouri National Guard.

Circumstances (causes) leading to the release:

_____

_____

_____

Steps taken to prevent recurrence of the release:

_____

_____

Date SWPPP modified to reflect the release and prevent similar future release: _____

Printed Name: _____

Signature/Title: _____

Organization: _____

CONNECT CAMP CLARK SEWER SYSTEM TO CITY OF NEVADA SEWER SYSTEM
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SUBCONTRACTORS CERTIFICATION LIST

SUBCONTRACTOR	ADDRESS	DATE SIGNED

CONNECT CAMP CLARK SEWER SYSTEM TO CITY OF NEVADA SEWER SYSTEM
CAMP CLARK NATIONAL GUARD TRAINING SITE, NEVADA, MO
PROJECT No. T2301-02

SUBCONTRACTORS CERTIFICATION

I certify under penalty of law, that I, being an authorized representative of the Subcontractor for the permittee, understand the terms and conditions of the National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge General Permit issued by the Missouri Department of Natural Resources (MDNR) and this Storm Water Pollution Prevention Plan (SWPPP) and shall comply with all conditions of the SWPPP, and the Permit for authorized Storm Water Discharges Associated with Construction or Land Disturbance Activities as issued by the MDNR Water Pollution Control Program, and that any non-compliance with the general permit constitutes a violation of Chapter 644, Missouri Clean Water Law, and 10 CSR 20-6.200. Non-compliance may result in enforcement action, termination of this authorization, or denial of the permittee's request for renewal.

_____
Printed or Typed Name and Title

_____
Subcontractor's Representative Signature

_____
Date

For: _____
Subcontractor Name (Print)

_____
Subcontractor Address

_____
City/State

_____
Subcontractor Telephone Number

APPENDIX A

MDNR TECHNICAL BULLETIN

RESPONSE TO SMALL FUEL SPILLS

Missouri
Department of Natural Resources
Department of Public Safety

Response to Small Fuel Spills

DNR Environmental Services Program/DPS Division of Fire Safety fact sheet 3/2009

Local fire departments often respond to releases of small amounts of petroleum products. This technical bulletin is intended to provide fire departments with information regarding responses to these types of releases.

Missouri state law requires the responsible party (spiller) to report petroleum product releases greater than 50 gallons to the Missouri Department of Natural Resources (DNR) at (573) 634-2436 at the earliest practical moment upon discovery. If the release is from an underground storage tank (UST) or piping, the reportable quantity is 25 gallons or more. Above ground storage tanks (AST) that have released 50 gallons or greater are also required to report. Further, federal law requires the responsible party to report any release of oil if the oil reaches or threatens any waterway. The definition of waterway includes sewers, groundwater, wetlands, lakes, creeks, streams, rivers and areas that may not have running water in them at the time, such as road ditches that drain into other waterways.

In the past, small fuel spills were routinely addressed by “flushing” with either foam or water. Unfortunately, this manner of response often resulted in the fuel reaching a waterway, potentially causing a greater problem than the initial spill itself. While many fire departments realize that flushing may cause more problems than it solves, information regarding alternative cleanup methods may not be readily available. The following information is provided by the Missouri Department of Public Safety (DPS) and DNR as possible alternative response actions to small fuel spills.

NOTE: It is understood that public safety must be the first consideration in a response and that the following actions may not be the most appropriate in certain situations.

1. If possible, the spill of fuel should be contained and the release stopped. Apply sand, gravel, soil, straw, sawdust, ground corn cobs, or commercial absorbents such as kitty litter or oil dry to absorb/contain petroleum residues rather than wash them away with water. Attempt to identify and take measures to protect any stormwater drains with absorbents. Absorbent materials used to clean up fuel spills may be disposed at a sanitary landfill with prior approval of the landfill operator.

2. If fire hazard reduction measures are necessary, use foam as appropriate. Do not over apply. Use as little water on the spill as necessary.

3. Pump, recover, and containerize as much free product as possible. In many cases, recovered product can be routed back to refineries for recycling, or used for other purposes such as fire department training exercises. Another method of disposal is use in fuel blending operations; however, this is not a viable alternative if the fuel has been contaminated with large amounts of water. If the spilled fuel contains too much water to lend itself as a usable resource, it may have to be tested and disposed as a regulated hazardous waste.

4. If flushing with water is the chosen option to mitigate hazards, runoff should be containerized and/or routed to a sanitary sewer **with the knowledge and approval of the wastewater treatment plant operator**.

5 .Treatment chemicals and agents should not be used except under special circumstances and with prior authorization obtained from the U.S. Environmental Protection Agency. A list of treatment chemicals and chemical countermeasures can be found at: http://www.epa.gov/emergencies/docs/oil/ncp/schedule.pdf.
If a fire department has questions as to the proper application of such agents, DNR may be contacted 24 hours a day at 573-634-2436 for technical assistance. As stated in Item 3, water contaminated with petroleum may be required by law to be tested and disposed as a hazardous waste.

According to Missouri Hazardous Waste Management Laws and Regulations, the responsibility for proper disposal of a hazardous waste is that of the owner of that waste (who could be the spiller, the owner of the shipment, or the owner of a facility where the spill occurred). Fire departments should exercise CAUTION; if the material is flushed to a waterway during a response, it could potentially cause water quality issues that would prolong the remediation of the spill.

Not all fire departments have financial resources to maintain stocks of absorbent materials, containers, and other related response equipment. Access to vacuum trucks, heavy equipment, and other necessary services may, likewise, be difficult for some jurisdictions to obtain. It is recommended that a fire department's contingency planning include identification of supply and service sources in order to be prepared for these types of releases.

Every response method has its own inherent advantages and disadvantages. Specific response methods must be evaluated and initiated on a case-by-case basis.

Questions about this guidance may be directed to DNR's Environmental Emergency Response Section at 573-526-3349 (non-emergency), or 573-634-2436 (emergency), or to DPS's Division of Fire Safety at 573-51-2930 (non-emergency).

On the Web:

www.dnr.mo.gov -- http://www.dnr.mo.gov/pubs/pub212.pdf, or
www.dfs.dps.mo.gov

PUB000212

APPENDIX B

MDNR FACT SHEET

OPEN BURNING UNDER MISSOURI REGULATIONS

Missouri Department of Natural Resources

Facts on Open Burning Under Missouri Regulations

Air Pollution Control Program fact sheet 1/2008

Open burning is the burning of any materials in which air contaminants are emitted directly into the air without first passing through a stack or chimney. This fact sheet summarizes allowable and prohibited open burning under Missouri regulations. It does not include open burning restrictions that city or county governments may impose in addition to Missouri's state regulations. Prior to conducting any open burning, businesses and citizens should contact the city or county of jurisdiction for any local restrictions.

The open burning of certain trade wastes and tires is prohibited because the toxic emissions that can be released are harmful to human health. Smoke from fires also typically produces large amounts of small particulate matter that can be inhaled, causing respiratory problems. The burning of common household trash, including paper products and food wastes, can also have severe consequences. Studies have indicated the open burning of an individual household's trash could release pollutants in higher levels than the burning of the trash of thousands of homes by a municipal waste incinerator because the lower combustion temperatures prevent complete incineration. These pollutants can include dioxins, volatile organic compounds, acetaldehyde, formaldehyde, hydrogen chloride and naphthalene. Open burning exposes individuals to toxic emissions that may irritate the eyes, skin and upper respiratory tract. The central nervous system can also be affected causing headaches, dizziness and fatigue.

Because of these potential dangers, the Missouri Department of Natural Resources strongly discourages open burning of any material prior to investigating alternatives. Some rural areas can participate in a "green box" service, which provides a trash collection point near a centrally located county road for local residents to use. Green boxes are usually picked up or emptied once a week. Other options include waste disposal services, waste diversion, recycling and composting. Contact your local Solid Waste Management District for assistance in implementing these safer alternatives to open burning.

Prohibited Open Burning Under State Regulation

Any waste generated by a business, trade, industry, salvage or demolition operation cannot be burned without a permit issued by the Department of Natural Resources or its delegated local agency. Permits will only be considered for untreated wood wastes. Wastes that may not be burned include but are not limited to tires, rubber products, hazardous materials, styrofoam, plastics, petroleum based products, demolition waste, treated wood and any asbestos-containing material.

Allowable Open Burning Under State Regulations

Note: Local governments may have stricter laws and policies

Open Burning of Household Refuse

General Provisions: Missouri allows open burning of household refuse from four dwelling units or less provided it originates and is burned on the same premises. This exemption does not apply to mobile home parks or apartment complexes. Residential waste is solid waste produced by routine household activities, such as paper waste and garbage from daily activities. This does not include home remodeling wastes, wastes from home businesses, durable goods such as old appliances, carpets or furniture, tires or other nonroutine household waste. Materials such as tires or used oil may not be used to start the fires or be burned in the fires.

Kansas City and St. Joseph metropolitan areas: Open burning is allowed provided it occurs within an area zoned for agricultural purposes and outside the portion of the metropolitan areas surrounding the corporate limits of Kansas City and St. Joseph and their bordering municipalities.

Outstate area: No special day, time or location restrictions.

Springfield-Greene County area: Open burning is allowed provided that burning takes place outside the corporate limits of Springfield and only within areas zoned A-1, Agricultural District.

St. Louis metropolitan area: Open burning of household refuse is prohibited in the St. Louis metropolitan area.

Open Burning of Yard Wastes

General Provisions: Missouri allows open burning of yard wastes from sites provided it originates and is burned on the same premises. Materials such as tires or used oil may not be used to start the fires or be burned in the fires. Yard waste includes trees, tree leaves, brush or other vegetation.

Kansas City metropolitan area: Open burning of trees, tree leaves, brush or any other type of vegetation requires an open burning permit.

St. Joseph metropolitan area: Open burning of residential yard wastes is allowed only during a three week period in spring and during a three-week period in fall between 10 a.m. and 3:30 p.m. The two, three-week periods are to be determined by the city along with state agencies and the state fire marshal.

Outstate area: No special day, time or location restrictions.

Springfield-Greene County area: Open burning of trees, brush or any other type of vegetation requires an open burning permit. The open burning of leaves is prohibited.

St. Louis metropolitan area: Open burning of trees, tree leaves or brush is allowed only in areas outside of incorporated municipalities from Sept. 16 to April 14 of each calendar year. These brush piles are limited to a base of 16 square feet and the burning is allowed from 10 a.m. through 4 p.m.

Open Burning for Fire Training Purposes

Missouri allows fires set for the purpose of training fire fighters provided they are conducted in accordance with National Fire Protection Association Standards 600 and 1403. Timely notification should be provided to the appropriate regional office or delegated local agency. All fire training exercises involving donated or acquired structures must be conducted in compliance with 40 CFR part 61 subpart M, *National Emission Standard for Hazardous Air Pollutants-Asbestos.* The use of donated or acquired structures for training is discussed in Publication 2029. All petroleum based products and asbestos containing materials must be removed from donated or acquired structures prior to any burning.

Open Burning in Agricultural, Natural Resource or Land Management Operations

Missouri allows agricultural burning throughout the state. However, several exceptions apply. Materials such as tires or used oil may not be used to start the fires or be burned in the fires. Any burning that creates a health hazard, nuisance or produces smoke that impairs visibility for those operating motor vehicles or airplanes is prohibited. Contact the St. Louis Regional Office before burning in the St. Louis metropolitan area from April 15 to Sept. 15. Botanical nursery operations (greenhouses) are not considered agricultural operations.

Open Burning in Land Clearing Operations

Open burning of tree trunks, tree limbs and vegetation from land clearing operations is allowed without an ACD or permit in the outstate area if the burning takes place outside the city limits of any incorporated area or municipality and at least 200 yards from the nearest inhabited dwelling. Materials such as tires or used oil may not be used to start the fires or be burned in the fires. Permits containing special conditions may be issued by regional offices or local agencies for sites unable to comply with the requirements above. See the Required Open Burning Permits section below for exceptions in the Springfield-Greene County area, and Kansas City and St. Louis Metropolitan areas.

Open Burning at Wood Processing Facilities

Open burning of untreated wood waste from wood processing facilities is allowed if production is less than 8,000 board-feet per day and the facility was in existence as of March 25, 1976, but has not relocated to a new site. The burning also must be done at least 200 yards from the nearest occupied structure.

Open burning of untreated wood waste from wood processing facilities is allowed if production is less than 8,000 board-feet per day and the facility has relocated or from new wood processing facilities not in existence as of Sept. 18, 1970, and the facility and the burning are at least one mile outside city limits. The burning also must be done at least 200 yards from the nearest occupied structure.

Open Burning for Recreational Purposes

Campfires and other fires used solely for recreational purposes, ceremonial occasions or for outdoor noncommercial preparation of food are allowed in Missouri. Fires shall include only vegetative woody materials or untreated wood products.

Required Open Burning Permits

The open burning of certain trade wastes, primarily untreated wood wastes such as pallets or crates, throughout the state, and vegetation from land clearing operations in the Springfield-Greene County area and the Kansas City and St. Louis Metropolitan areas, may be permitted only when it can be shown that open burning is the only feasible method of disposal and that disposal is in the public interest. In the St. Louis nonattainment area, permits will not be issued

unless it can be shown that emissions from open burning would be less than any other waste management or disposal method. The open burning permit requires the facility, in most cases, to use an air curtain destructor.

Commercial and municipal utility tree trimming operations must submit a request to the appropriate regional office for an annually renewable open burning permit. The request must describe the general size, condition and age of the tree trunks and tree limbs to be open burned. Air curtain destructors are generally required at dedicated sites where burning occurs.

Commercial and municipal utility tree trimming operations must submit an application for an open burning permit to the appropriate regional office or local agency.

The information provided in this fact sheet should not be construed to permit open burning that causes or constitutes a public health hazard, nuisance or a hazard to vehicular or air traffic or violates any other rule or statute.

Definitions

St. Louis metropolitan area: The geographical area comprising St. Louis, St. Charles, Jefferson and Franklin Counties and the city of St. Louis. These counties are also currently a nonattainment area for ground-level ozone.

Springfield-Greene County area: The geographical area contained within Greene County.

Kansas City metropolitan area: The geographical area comprising Jackson, Cass, Clay, Platte, Ray and Buchanan counties.

Outstate area: The geographical area comprising those counties not contained in the St. Louis metropolitan area, the Springfield-Greene County area or the Kansas City metropolitan area.

Air Curtain Destructor: An air pollution control device designed to increase burning efficienc, reducing air contaminant emissions during open burning.

Open Burning Permit: A permit that must be applied for and then granted in order to open burn or open burn with restrictions. Permit applications must be sent to the Regional Office or local agency that has jurisdiction over your area. Applications are available at www.dnr.mo.gov/forms or any regional or local agency office.

Untreated Wood: Lumber and other wooden materials that have not been chemically treated for resistance to moisture, fire, fungi, insects and other pests or has not otherwise been treated or manufactured with chemicals, or that does not contain adhesives or resins. Untreated wood does not include plywood, particleboard, chipboard or wood with other than minimal amounts of paint, coating or finish.

For More Information

Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176, Jefferson City, MO 65102-0176
1-800-361-4827 or (573) 751-4817 office
(573) 751-2706 fax
www.dnr.mo.gov/env/apcp/index.html

Missouri Department of Natural Resources
Solid Waste Management Program
P.O. Box 176, Jefferson City, MO 65102-0176
1-800-361-4827 or (573) 751-5401 office
(573) 526-3902 fax
www.dnr.mo.gov/env/swmp/index.html

APPENDIX C

LAND DISTURBANCE PERMIT

Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Michael L. Parson, Governor
Dru Buntin, Director

Camp Clark Training Site WWTF
MORA25810, Vernon County
NGMO EM Missouri Army National Guard
6819B N Boundary Rd
Jefferson City, MO 65101 - 1203

Pursuant to the Federal Water Pollution Control Act, under the authority granted to the State of Missouri and in compliance with the Missouri Clean Water Law, the Missouri Department of Natural Resources (Department) has issued, and we are enclosing your Missouri State Operating Permit which authorizes land disturbance activities for Camp Clark Training Site WWTF.

This General Permit is both your federal discharge permit and your new state operating permit and replaces all previous state operating permits and letters of approval for the discharges described within. In all future correspondence regarding this permit, please refer to your general permit number as shown on page one of your permit.

Please note that prior to the beginning of land disturbance activities other permits may also be required. Especially note the requirements for a Department 401 Water Quality Certification and the U.S. Army Corps of Engineers 404 permit. A 401 Certification is needed when placing material, or fill, into the jurisdictional waters of the Unites States. Examples are culverts under road crossings, riprap along stream banks and storm water outfall pipes. The term jurisdictional waters refers to large lakes, rivers, streams and wetlands, including those that don't always contain water.

This permit may include requirements with which you may not be familiar. If you would like the Missouri Department of Natural Resources (Department) to conduct a Compliance Assistance Visit to discuss the permit, an appointment can be set up by contacting your local Department Regional Office or the Water Pollution Program at 573-751-1300.

The permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP). Refer to your permit for more information on this SWPPP.

The requirements found in this permit do not supersede nor relieve liability for compliance with other federal, state, county, or local statutes, regulations, or ordinances. Also, any exemptions found in this permit do not imply an exemption from other permits from the Department. It is your responsibility to ensure that any and all necessary permits for this facility have been obtained.

If you were adversely affected by this decision, you may be entitled to an appeal before the Administrative Hearing Commission (AHC) pursuant to Sections 644.051.6 and 621.250, RSMo. To appeal, you must file a petition with the AHC within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is

received by the AHC. Contact information for the AHC is as follows: Administrative Hearing Commission, United States Post Office Bldg., Third Floor, 131 West High Street, Jefferson City, MO 65101, and PO Box 1557, Jefferson City, MO 65102. phone: 573 751 2422, fax: 573 751 5018, website: www.oa.mo.gov/ahc.

If you have any questions concerning this permit, please do not hesitate to contact us by mail at Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, MO 65102-0176, or by phone at 573-522-4502. Thank you.

Sincerely,

Water Protection Program

John Hoke
Director

JH

Camp Clark Training Site WWTF
MORA25810

ePermitting Certification and Signature Document

Missouri State Operating General Permit number MORA25810 was issued on 01-23-2024 based on information entered into the Missouri Department of Natural Resources' electronic Permitting (ePermitting) system. Missouri Regulation 10 CSR 20-6.010(2)(B) requires that all applications for construction and operating permits be signed.

Camp Clark Training Site WWTF, Vernon County
18159 South K Highway
NEVADA, MO 64772 - 9411
Total Permitted Area: 4.82 Acres
Total Number of Permitted Features: 1

Based upon the selection you made on the 'New Permit' screen; it was indicated that a single polygon was drawn indicating the entire disturbance area.

Is any part of the area that is being disturbed in a jurisdictional water of the United States? If yes, you must also receive a Clean Water Act, Section 404 Permit for this site from the United States Army Corp of Engineers.
No

Is any section of the area that is being disturbed part of a housing development (subdivision)? If yes, additional regulations may apply depending on the nature of wastewater treatment. Please consult and follow 10 CSR 20-6.030 Disposal of Wastewater in Residential Housing Development regulations if onsite wastewater treatment (septic) systems will be used as the method of wastewater treatment. If you have any questions or concerns about the regulation please contact the Water Pollution Control Branch, Operating Permits Section at 573-522-4502.
No

I understand there may be an established Local Authority Erosion Control Plan in the city or the unincorporated area of the county where land disturbance activities covered under this general permit will occur. (Note - you may want to contact your local authority to determine if there are any requirements).
Agreed

A Stormwater Pollution Prevention Plan (SWPPP) must be developed for this site. This plan must be developed in accordance with requirements and guidelines specified within the general permit for storm water discharges from land disturbance activities. The application will be considered incomplete if the SWPPP has not been developed.
Agreed

The above certifications were made electronically in the ePermitting system by:
Name: Spencer Warrick
Date: 01/23/2024

I certify that I am familiar with the information contained in the application, that to the best of my knowledge and belief such information is true, complete and accurate, and being granted this permit, I agree to abide by the Missouri Clean Water Law and all rules, regulations, orders and decisions, and terms of this permit, subject to any legitimate appeal available to an applicant under the Missouri Clean Water Commission.
Agreed

Spencer Warrick
Signature

01-23-2024
Date

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.:	MORA25810
Owner Address:	NGMO EM Missouri Army National Guard 6819B N Boundary Rd Jefferson City, MO 65101 - 1203
Continuing Authority:	NGMO EM Missouri Army National Guard 6819B N Boundary Rd Jefferson City, MO 65101 - 1203
Facility Name: Facility Address:	Camp Clark Training Site WWTF 18159 South K Highway NEVADA, MO 64772 - 9411
Legal Description: UTM Coordinates: Receiving Stream: First Classified Stream - ID#: USGS# and Sub Watershed#:	Sec. 18, T 35N, R 30W, Vernon County 386349.907 / 4186337.327 Tributary to West Fork Clear Creek (U) Presumed Use Streams (C) 5055.00 10290105 - 0104

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 - 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 authorizes activities pursuant to the terms and conditions of this permit in accordance with the Missouri Clean Water Law and/or the National Pollutant Discharge Elimination System; it does not apply to other regulated activities.

01-23-2024
Issue date

02/07/2027
Expiration date

John Hoke, Director, Water Protection Program

I. APPLICABILITY

A. Permit Coverage and Authorized Discharges

1. This Missouri State Operating Permit (permit) authorizes the discharge of stormwater and certain non-stormwater discharges from land disturbance sites that disturb one or more acres, or disturb less than one acre when part of a larger common plan of development or sale that will disturb a cumulative total of one or more acres over the life of the project. A permit must be issued before any disturbance of root zone of the existing vegetation or other land disturbance activities may begin.

2. If an individual or developer proposes to improve a lot for development or sale that is less than an acre and part of a common plan of development or sale, a permit is required. If an individual proposes to develop a lot to reside on themselves, the development is not considered part of the larger common plan of development or sale and does not require a permit unless the lot is an acre or more [10 CSR 20-6.200 (1)(B)6.]. See table below.

Permit Requirements for a Common Promotional Plan

	Land Disturbance Permit Required?	
	Less than one acre (< 1 acre)	One acre or more (≥ 1 acre)
Land disturbance by a developer (or a contractor working on their behalf), regardless of type of development (initial, commercial, residential)	Yes, if part of a larger common plan of development or sale with cumulative disturbance of one or more acres including individual residential lots in order to improve the lot for sale	Yes
Land disturbance by an individual to reside on themselves (or a contractor working on their behalf)	No	Yes

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)].

A Missouri State Operating Permit (MORA, MOR100, or site specific) that specifically identifies the project must be issued before any site vegetation is removed (disturbance of the root zone) or the site disturbed [10 CSR 20-6.200 (1)(A)].

Any persons who operate, use, or maintain a land disturbance activity (owner/operator) which is subject to permitting requirements for stormwater discharges from land disturbance activities, who disturbs land prior to permit issuance from the Department is in violation of both State [10 CSR 20-6.200 (1)(A)] and Federal regulations.

The owner/operator and continuing authority of this permit are responsible for compliance with this permit [10 CSR 20-6.200 (3)(B)].

The primary operator(s) of a land disturbance site is any party associated with the project who either: 1) has operational control over construction plans, including the ability to make modifications to those plans; or 2) has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions. This may be the General Contractor, Project Manager, or similar role.

3. This permit authorizes stormwater discharges from land disturbance support activities (e.g., equipment staging yards, material storage areas, excavated material disposal areas, borrow areas, concrete, or asphalt batch plants) provided appropriate stormwater controls are designed, installed, and maintained and the following conditions are met and addressed in the Stormwater Pollution Prevention Plan (SWPPP):
   (a) The support activity is directly related to the construction site required to have permit coverage for stormwater discharges;
   (b) The support activity is not a commercial operation or serve multiple unrelated construction sites;
   (c) The support activity does not continue to operate beyond the completion of the construction activity at the project it supports;
   (d) Sediment and erosion controls are implemented in accordance with the conditions of this permit; and
   (e) The support activity is strictly stormwater discharges. Support activities which discharge process water shall apply for separate coverage, such as a concrete batch plant discharging process water shall be covered under a MOG49.

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

4. This permit authorizes non-stormwater discharges from the following activities provided that these discharges are treated by appropriate Best Management Practices (BMPs) where applicable and addressed in the permittee's specific SWPPP required by this general permit:
   (a) Discharges from emergency fire-fighting activities;
   (b) De-chlorinated fire hydrant flushing;
   (c) Uncontaminated water line flushing;
   (d) Uncontaminated condensate from air conditioning or compressor condensate;
   (e) Landscape watering;
   (f) Uncontaminated, non-turbid discharges of ground water or spring water;
   (g) Foundation or footing drains where flows are not contaminated with process materials;
   (h) Water used to control dust; and
   (i) Pavement wash waters, provided spills or leaks of toxic or hazardous substances have not occurred (unless all spill material has been removed) and where soaps, solvents, and detergents are not used. Directing pavement wash waters directly into any water of the state, storm inlet, or stormwater conveyance, unless the conveyance is connected to an effective control, is prohibited.

5. 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, shall notify the Department's Water Protection Program for approval before applying for coverage under this permit. The Department reserves the right to revoke or deny coverage under this general permit; a site-specific permit may be required to cover such activities.

B. Permit Restrictions

1. Any non-stormwater discharges other than those explicitly authorized in Part I APPLICABILTY, Condition A.3 are prohibited under this permit.

2. This permit does not authorize the discharge of process wastewaters, treated or otherwise, including water used to wash machinery, equipment, buildings, or wastewater from washout of concrete.

3. For sites operating within the watershed of any Outstanding National Resource Water (which includes the Ozark National Riverways and the National Wild and Scenic Rivers System), sites that discharge to an Outstanding State Resource Water, or facilities located within the watershed of an impaired water as designated in the 305(b) report, including the 303(d) list, with an impairment for sediment:
   (a) This permit authorizes stormwater discharge so long as no degradation of water quality occurs due to discharges from the permitted facility per 10 CSR 20-7.031(3)(C) and as long as the facility is 1,000 or more feet away from the Outstanding National or State Resource Water or a water of the state with an impairment for sediment.
   (b) A site with a discharge found to be causing degradation or contributing to an impairment by discharging a pollutant of concern, during an inspection or through complaint investigations, may be required to become a no discharge facility or obtain a site-specific permit with more stringent monitoring and SWPPP requirements.
   (c) For sites within 1,000 feet of Outstanding National or State Resource Water or a water of the state with an impairment for sediment, the site shall operate as a no-discharge facility as defined in 10 CSR 20-6.015(1)(B)7, and discharges from dewatering of sedimentation basins is prohibited.

4. This general permit does not authorize the placement of fill materials in flood plains, placement of fill into any floodway, the obstruction of stream flow, or changing the channel of a defined drainage course. This general permit addresses only the quality of the stormwater runoff and the minimization of off-site migration of sediments and other water contaminants.

5. This permit does not allow stream channel or wetland alterations unless approved by Section 404 of the federal Clean Water Act (CWA) permitting authorities. Land disturbance activities may not begin in waters of the United States until any required Section 404 permit and Section 401 certification have been obtained.

6. This operating permit does not affect, remove, or replace any requirement of the National Environmental Policy Act; the Endangered Species Act; the National Historic Preservation Act; the Comprehensive Environmental Response, Compensation and Liability Act; the Resource Conservation and Recovery Act; or any other relevant acts. Determination of applicability to the above mentioned acts is the responsibility of the permittee. Additionally, this permit does not establish terms and conditions for runoff resulting from silvicultural activities listed in Section 402(l)(3)(a) of the Clean Water Act.

7. Compliance with all requirements in this permit does not supersede any requirement for obtaining project approval from an established local authority nor remove liability for compliance with county and other local ordinances.

8. The Department may require any facility or site authorized by a general permit to apply for a site-specific permit [10 CSR 20-6.010(13)(C)]. Cases where a site-specific permit may be required include, but are not limited to, the following:
   (a) The discharge(s) is a significant contributor of a pollutant(s) which impairs the designated uses or general criteria of the receiving stream;
   (b) The discharger is not in compliance with the conditions of the general permit;
   (c) A Total Maximum Daily Load (TMDL) containing requirements applicable to the discharge(s) is approved; or
   (d) Materials or contaminants exist at the site, or are brought to the site to use as fill or borrow, which may necessitate special controls or permit limits not otherwise considered under this general permit, such as contaminated soils from federal clean-up sites. This general permit may be authorized when additional contaminant controls are proposed by the applicant and the proposal is accepted by the Department in written correspondence.

9. If a facility or site covered under a current general permit desires to apply for a site-specific permit, the facility or site may do so by contacting the Department for application requirements and procedures.

10. Any discharges not expressly authorized in this permit and not clearly disclosed in the permit application cannot become authorized or shielded from liability under CWA section 402(k) or Section 644.051.16, RSMo, by disclosure to EPA, state, or local authorities after issuance of this permit via any means, including any other permit applications, funding applications, the SWPPP, discharge monitoring reporting, or during an inspection. Discharges at the facility not expressly authorized by this permit must be covered by another permit, be exempt from permitting, or be authorized through some other method.

11. In the event that a State of Emergency is declared, either by the State or Federal government, and as a result an emergency-related project requires land disturbance activity that requires a permit, the owner/operator of the project may begin work prior to permit issuance so long as they implement sediment and erosion controls in compliance with the master general permit conditions contained herein. The owner/operator is not exempt from permitting and shall apply for the land disturbance permit as soon as practicable but no later than seven calendar days after starting work. The Department may determine that other emergencies, considered on a case-by-case basis, are applicable. Contact the Department to determine if non-state of emergencies are applicable.

II. EXEMPTIONS FROM PERMIT REQUIREMENTS

1. Facilities that discharge all stormwater runoff directly to a combined sewer system (as defined in 40 CFR 122.26 and 40 CFR 35.2005) connecting to a publicly owned treatment works which has consented to receive such a discharge are exempt from Department stormwater permit requirements.

2. Land disturbance activities that disturb less than one (1) acre of total land area which are not part of a common plan of sale where water quality standards are not exceeded are exempt from Department stormwater permit requirements. Land disturbance activity on an individual residential building lot is not considered as part of the overall subdivision unless the activity is by the developer to improve the lot for sale.

3. Oil and gas related activities as listed in 40 CFR 122.26(a)(2)(ii) where water quality standards are not exceeded are exempt from Department stormwater permit requirements.

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

III. REQUIREMENTS

1. The permittee shall post a public notification sign at the main entrance to the site with the specific MORA permit number. The public notification sign must be visible from the public road that provides access to the site's main entrance. An alternate location is acceptable provided the public can see it and it is noted in the SWPPP. The public notification sign must remain posted at the site until the permit has been terminated. The sign is provided at the end of this permit.

2. The permittee shall be responsible for notifying the land owner and each contractor or entity (including utility crews and city employees or their agents) who will perform work at the site of the existence of the SWPPP and what actions or precautions shall be taken while on-site to minimize the potential for erosion and the potential for damaging any BMP. The permittee is responsible for any damage a subcontractor may do to established BMPs and any subsequent water quality violation resulting from the damage.

3. Ensure the design, installation, and maintenance of effective erosion and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed, and maintained to:
   (a) Control stormwater volume, velocity, and peak flow rates within the site to minimize soil erosion;
   (b) Control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion and scour;
   (c) Minimize the amount of exposed soil during construction activity;
   (d) Minimize the disturbance of steep slopes;
   (e) Minimize sediment discharges from the site. Address factors such as:
      1) the amount, frequency, intensity, and duration of precipitation;
      2) the nature of resulting stormwater runoff;
      3) expected flow from impervious surfaces, slopes, and drainage features; and
      4) soil characteristics, including the range of soil particle size expected to be present on the site;
   (f) Provide and maintain natural buffers around surface waters as detailed in Part V. BMP REQUIREMENTS Condition 7, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration and filtering, unless infeasible;
   (g) Minimize soil compaction and preserve topsoil where practicable; and
   (h) Capture or treat a 2-year, 24-hour storm event.

4. 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 https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html.
   (a) As an alternative to utilizing NOAA Atlas 14 for site specific data to determine the 2-year, 24-hour storm event the conservative default value can be used based on the map provided by the Department in the Factsheet portion of this permit. The permittee may choose which source to use for the site specific data.

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

6. Installation of BMPs necessary to prevent soil erosion and sedimentation at the downgradient project boundary (e.g. buffers, perimeter controls, exit point controls, storm drain inlet protection) must be complete prior to the start of all phases of construction. By the time construction activity in any given portion of the site begins, downgradient BMPs must be installed and operational to control discharges from the initial site clearing, grading, excavating, and other earth-disturbing activities. Additional BMPs shall be installed as necessary throughout the life of the project. Following the installation of these initial BMPs, all BMPs needed to control discharges shall be installed and made operational prior to subsequent earth disturbing activities.

7. Temporary BMPs may be added and removed as necessary with updates to the SWPPP as specified in the requirements below.

8. All BMPs shall be maintained and remain in effective operating condition during the entire duration of the project, with repairs made within the timeframes specified elsewhere in this permit, until final stabilization has been achieved.
   (a) Ensure BMPs are protected from activities that would reduce their effectiveness.
   (b) Remove any sediment per the BMP manufacturer's instructions or before it has accumulated to one-half of the above-ground height of any BMP that collects sediment (i.e. silt fences, sediment traps, etc.)
   (c) The project is considered to achieve final stabilization when Part V. BMP REQUIREMENTS, Condition 13 is met.

9. Minimize sediment trackout from the site and sediment transport onto roadways.
   (a) Restrict vehicle traffic to designated exit points.
   (b) Use appropriate stabilization techniques or BMPs at all points that exit onto paved roads or areas outside of the site.
   (c) Use additional controls to remove sediment from vehicle and equipment tires prior to exit from facility where necessary.
   (d) Any sediment or debris that is tracked out past the exit pad or is deposited on a roadway after a precipitation event shall be removed the shorter of either daily or before a rain event. Remove the track-out sediment by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. Sediment or debris tracked out

on pavement or other impervious surfaces shall not be disposed of into any stormwater conveyance, storm drain inlet, or water of the state.

(e) Stormwater inlets susceptible to receiving sediment or other pollutants from the permitted land disturbance site shall have curb inlet protection. This may include inlets off the active area where track out from vehicles and equipment could impact the stormwater runoff to those inlets.

10. Concrete washout facilities shall be used to contain concrete waste from the activities onsite, unless the washout of trucks and equipment is managed properly at an offsite location.
The washout facility shall be managed to prevent solid and/or liquid waste from entering waters of the state by the following:
(a) Direct the wash water into leak-proof containers or pits designed so that no overflows can occur due to inadequate sizing or precipitation;
(b) Locate washout activities a minimum of 50 feet from waters of the state, stormwater inlets and/or stormwater conveyances;
(c) Washout facilities shall be cleaned, or new facilities must be constructed and ready for use, once the washout is 75% full;
(d) Designate the washout area(s) and conduct such activities only in these areas.
(e) Ensure contractors are aware of the location, such as by marking the area(s) on the map or signage visible to the truck and/or equipment operators.

11. Good housekeeping practices shall be maintained at all times to keep waste from entering waters of the state.
(a) Provide solid and hazardous waste management practices, including providing trash containers, regular site cleanup for proper disposal of solid waste such as scrap building material, product/material shipping waste, food/beverage containers, spent structural BMPs;
(b) Provide containers and methods for proper disposal of waste paints, solvents, and cleaning compounds.
(c) Manage sanitary waste. Portable toilets shall be positioned so that they are secure and will not be tipped or knocked over and so that they are located away from waters of the state and stormwater inlets and stormwater conveyances.
(d) Ensure the storage of construction materials be kept away from drainage courses, stormwater conveyances, storm drain inlets, and low areas.

12. All fueling facilities present shall at all times adhere to applicable federal and state regulations concerning underground storage, above ground storage, and dispensers.

13. Any hazardous wastes that are generated onsite shall be managed, stored, and transported according to the provisions of the Missouri Hazardous Waste Laws and Regulations.

14. Store all paints, solvents, petroleum products, petroleum waste products, and storage containers (such as drums, cans, or cartons) so they are not exposed to stormwater or provide other prescribed BMPs such as plastic lids and/or portable spill pans to prevent the commingling of stormwater with container contents. Commingled water may not be discharged under this permit. Provide spill prevention, control, and countermeasures to contain the spill. Any containment system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall prevent the contamination of groundwater.

15. Implement measures intended to prevent the spillage or loss of fluids, oil, grease, fuel, etc. from vehicles and equipment to thereby prevent the contamination of stormwater from these substances. This may include prevention measures such as, but not limited to, utilizing drip pans under vehicles and equipment stored outdoors, covering fueling areas, using dry clean-up methods, use of absorbents, and cleaning pavement surfaces to remove oil and grease.

16. Spills, Overflows, and Other Unauthorized Discharges.
(a) Any spill, overflow, or other discharge not specifically authorized in the permit above are unauthorized.
(b) Should an unauthorized discharge cause or permit any contaminants to discharge or enter waters of the state, the unauthorized discharge must be reported to the appropriate Regional Office as soon as practicable but no more than 24 hours after the discovery of the discharge. If the spill or overflow needs to be reported after normal business hours or on the weekend, the facility must call the Department's Environmental Emergency Response hotline at (573) 634-2436. Leaving a message on a Department staff member voice-mail does not satisfy this reporting requirement.
(c) A record of all spills shall be retained with the SWPPP and made available to the Department upon request.
(d) Other spills not reaching waters of the state must be cleaned up as soon as possible to prevent entrainment in stormwater but are not required to be reported to the Department.

17. The full implementation of this operating permit shall constitute compliance with all applicable federal and state statutes and regulations in accordance with RSMo 644.051.16 and the CWA §402(k); however, this permit may be reopened and modified or alternatively revoked and reissued to comply with any applicable effluent standard or limitation issued or approved under Clean Water Act §§ 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) if the effluent standard or limitation so issued or approved contains different conditions or is otherwise more stringent than any effluent limitation in the permit or controls any pollutant not limited

in the permit. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, termination, notice of planned changes, or anticipated non-compliance does not stay any permit condition.

IV. STORMWATER POLLUTION PREVENTION PLAN (SWPPP) MANAGEMENT REQUIREMENTS

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

   The purpose of the SWPPP is to ensure the design, implementation, management, and maintenance of BMPs in order to prevent sediment and other pollutants in stormwater discharges associated with the land disturbance activities [40 CFR 122.44 (k)(4)] from entering waters of the state above established general and narrative criteria; compliance with Missouri Water Quality Standards; and compliance with the terms and conditions of this general permit.
   (a) **The SWPPP must be developed and implemented prior to conducting any land disturbance activities and must be specific to the land disturbance activities at the site.**
   (b) The permittee shall fully implement the provisions of the SWPPP required under this permit as a condition of this general permit throughout the term of the land disturbance project. Failure to develop, implement, and maintain a SWPPP may lead to immediate enforcement action.
   (c) The SWPPP is a living document and shall be updated any time site conditions warrant adjustments to the project or BMPs.
   (d) Either an electronic copy or a paper copy of the SWPPP, and any required reports, must be accessible to anyone on-site at all times when land disturbance operations are in process or other operational activities that may affect the maintenance or integrity of the BMP structures and made available as specified under Part VIII. STANDARD PERMIT CONDITIONS, Condition 1 of this permit. The SWPPP shall be readily available upon request and should not be sent to the Department unless specifically requested

2. A SWPPP must be developed, implemented, and maintained at the site or electronically accessible by on-site personnel. Failure to implement and maintain the BMPs chosen, which can be revised and updated, is a permit violation. The chosen BMPs will be the most reasonable and cost effective while also ensuring the highest quality water discharged attainable for the facility. Facilities with established SWPPPs and BMPs shall evaluate BMPs on a regular basis and change the BMPs as needed if there are BMP deficiencies.

3. The SWPPP must:
   (a) List and describe the location of all outfalls;
   (b) List any allowable non-stormwater discharges occurring on site and where these discharges occur;
   (c) Incorporate required practices identified below;
   (d) Incorporate sediment and erosion control practices specific to site conditions;
   (e) Discuss whether or not a 404 Permit is required for the project;
   (f) Discuss whether the discharges are in the watershed of Outstanding National or State Resource Water or in the watershed of a water impaired for sediment.
   (g) Name the person(s) responsible for inspection, operation, and maintenance of BMPs. The SWPPP shall list the names and describe the role of all owners/primary operators (such as general contractor, project manager) responsible for environmental or sediment and erosion control at the land disturbance site.

4. The SWPPP briefly must describe the nature of the land disturbance activity, including:
   (a) The function of the project (e.g., low density residential, shopping mall, highway, etc.);
   (b) The intended sequence and timing of activities that disturb the soils at the site;
   (c) Estimates of the total area expected to be disturbed by excavation, grading, or other land disturbance support activities including off-site borrow and fill areas;
   (d) If within the boundaries of a regulated Municipal Separate Storm Sewer System (MS4s), list the name of the regulated MS4.

5. In order to identify the site, the SWPPP shall include site information including size in acres. The SWPPP shall have sufficient information to be of practical use to contractors and site construction workers to guide the installation and maintenance of BMPs.

6. The function of the SWPPP and the BMPs listed therein is to prevent or minimize pollution to waters of the state. A deficiency of a BMP means it was not effective in preventing or minimizing pollution of waters of the state.

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

   Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites, (Document number EPA 833-R-06-004) published by the United States Environmental Protection Agency (USEPA) in May 2007. This manual as well as other

information, including examples of construction SWPPPs, is available at the USEPA internet site at https://www.epa.gov/sites/production/files/2015-10/documents/sw_swppp_guide.pdf; and https://www.epa.gov/npdes/developing-stormwater-pollution-prevention-plan-swppp.

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

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

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

7. The SWPPP must contain a legible site map, multiple maps if necessary, identifying:
   (a) Site boundaries of the property;
   (b) Locations of all waters of the state (including wetlands) within the site and half a mile downstream of the site's outfalls;
   (c) Location of all outfalls;
   (d) Direction(s) of stormwater flow (use arrows) and approximate slopes before and after grading activities;
   (e) Areas of soil disturbance and areas that will not be disturbed (or a statement that all areas of the site will be disturbed unless otherwise noted);
   (f) Location of structural and non-structural BMPs, including natural buffer areas, identified in the SWPPP;
   (g) Locations where stabilization practices are expected to occur;
   (h) Locations of on-site and off-site material, waste, borrow or equipment storage areas and stockpiles;
   (i) Designated points where vehicles will exit the site;
   (j) Location of stormwater inlets and conveyances including ditches, pipes, man-made conduits, and swales; and
   (k) Areas where final stabilization has been achieved.

8. An individual shall be designated by the permittee as the environmental lead. This environmental lead shall have knowledge in erosion, sediment, and stormwater control principles, knowledge of the permit, and the site's SWPPP. The environmental lead shall ensure all personnel and contractors understand any requirements of this permit may be affected by the work they are doing. The environmental lead or designated inspector(s) knowledgeable in erosion, sediment, and stormwater control principles shall inspect all structures that function to prevent or minimize pollution of waters of the state.

9. Throughout coverage under this permit, the permittee shall amend and update the SWPPP as appropriate during the term of the land disturbance activity. All SWPPP modifications shall be signed and dated. The permittee shall amend the SWPPP to incorporate any significant site condition changes which impact the nature and condition of stormwater discharges. At a minimum, these changes include whenever the:
   (a) Location, design, operation, or maintenance of BMPs is changed;
   (b) Design of the construction project is changed that could significantly affect the quality of the stormwater discharges;
   (c) Permittee's inspections indicate deficiencies in the SWPPP or any BMP;
   (d) Department notifies the permittee in writing of deficiencies in the SWPPP;
   (e) SWPPP is determined to be ineffective in minimizing or controlling erosion and sedimentation (e.g., there is visual evidence of excessive site erosion or sediment deposits in streams, lakes, or downstream waterways, sediment or other wastes offsite); and/or
   (f) Department determines violations of water quality standards may occur or have occurred.

10. Site Inspections: The environmental lead, or a designated inspector, shall conduct regularly scheduled inspections. These inspections shall be conducted by a qualified person, one who is responsible for environmental matters at the site, or a person trained by and directly supervised by the person responsible for environmental matters at the site. Site inspections shall include, at a minimum, the following:
   (a) For disturbed areas that have not achieved final stabilization, all installed BMPs and other pollution control measures shall be inspected to ensure they are properly installed, appear to be operational, and are working as intended to minimize the discharge of pollutants.
   (b) For areas on site that have achieved either temporary or final stabilization, while at the same time active construction continues on other areas, ensure that all stabilization measures are properly installed, appear to be operational, and are

working as intended to minimize the discharge of pollutants.

(c) Inspect all material, waste, borrow, and equipment storage, and maintenance areas that are covered by this permit. Inspect for conditions that could lead to spills, leaks, or other accumulations of pollutants on the site.

(d) Inspect all areas where stormwater typically flows within the site, including drainage ways designed to divert, convey, and/or treat stormwater.

(e) All stormwater outfalls shall be inspected for evidence of erosion, sediment deposition, or impacts to the receiving stream. If a discharge is occurring during an inspection, the inspector must observe and document the visual quality of the discharge, and take note of the characteristics of the stormwater discharge, including turbidity, color; odor; floating, settled, or suspended solids; foam; oil sheen; and other indicators of stormwater pollutants.

(f) When practicable the receiving stream shall also be inspected for a minimum of 50 feet downstream of the outfall.

(g) The perimeter of the site shall be inspected for evidence of BMP failure to ensure concentrated flow does not develop a new outfall.

(h) The SWPPP must explain how the environmental lead will be notified when stormwater runoff occurs.

11. Inspection Frequency: All BMPs must be inspected in accordance to one of the schedules listed below. The inspection frequency shall be documented in the SWPPP, and any changes to the frequency of inspections, including switching between the options listed below, must be documented on the inspection form:

(a) At least once every seven (7) calendar days and within 48 hours after any storm event equal to or greater than a 2-year, 24-hour storm has ceased during a normal work day or within 72 hours if the rain event ceases during a non-work day such as a weekend or holiday; or

(b) Once every 14 calendar days and within 24 hours of the occurrence of a storm event of 0.25 inches of precipitation or greater, or the occurrence of runoff from snowmelt. To determine if a storm event of 0.25 inches or greater has occurred on the site, the permittee shall either keep a properly maintained rain gauge on site, or obtain the storm event information from a weather station near the site location.

1) Inspections are only required during the project's normal working hours.
2) An inspection must be conducted within 24 hours of a storm event which has produced 0.25 inches. The inspection shall be conducted within 24 hours of the event end, or within 72 hours if the rain event ceases during a non-work day such as a weekend or holiday.
3) If it is elected to inspect every 14 calendar days and there is a storm event at the site that continues for multiple days, and each day of the storm produces 0.25 inches or more of rain, the permittee shall conduct an inspection within 24 hours of the end of the storm or within 72 hours if the rain event ceases during a non-work day such as a weekend or holiday.

(c) For any portion of the site that discharges within the watershed of an Outstanding National or State Resource Water or a water impaired for sediment, inspections shall be inspected once every seven (7) calendar days and within 24 hours of the occurrence of a storm event of 0.25 inches or greater, or when the occurrence of runoff flow from frozen or snowmelt is sufficient to cause a discharge.

(d) Areas on-site that have achieved stabilization, while at the same time active construction continues on other areas, may reduce inspection frequency to monthly, for those stabilized areas, if the following conditions exist:

1) For areas where disturbed portions have undergone temporary stabilization, inspections shall occur at least once a month while stabilized and when re-disturbed shall follow either frequency outlined in (a),(b), or (c) above.
2) Areas on-site that have achieved final stabilization must be inspected at least once per month until the permit is terminated.

(e) If construction activities are suspended due to frozen conditions, the permittee may temporarily reduce site inspections to monthly until thawing conditions begin to occur if all of the following are met:

1) Land disturbances have been suspended; and
2) All disturbed areas of the site have been stabilized in accordance with Part V. BMP REQUIREMENTS, Condition 13.
3) The change shall be noted in the SWPPP.

(f) Any basin dewatering shall be inspected daily when discharge is occurring. The discharge shall be observed and dewatering activities shall be ceased immediately if the receiving stream is being impacted. These inspections shall be noted on a log or on the inspection report.

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

12. Site Inspection Reports: A log of each inspection and/or copy of the inspection report shall be kept readily accessible and must be made available upon request by the Department. Electronic logs are acceptable as long as reports can be provided within 24 hours. If inspection reports are kept off-site, the SWPPP must indicate where they are stored. The inspection report shall be signed by the environmental lead or designated inspector (electronically or otherwise).

(a) The inspection report is to include the following minimum information:

1) Inspector's name and title.
2) Date and time of inspection.
3) Observations relative to the effectiveness of the BMPs and stabilization measures. The following must be documented:
   a. Whether BMPs are installed, operational, and working as intended;
   b. Whether any new or modified stormwater controls are needed;
   c. Facilities examined for conditions that could lead to spill or leak;
   d. Outfalls examined for visual signs of erosion or sedimentation at outfalls. Excessive erosion or sedimentation may be due to BMP failure or insufficiency. Response to observations should be addressed in the inspection report.
4) Corrective actions taken or necessary to correct the observed problem.
5) Listing of areas where land disturbance operations have permanently or temporarily stopped.

13. Any structural or maintenance deficiencies for BMPs or stabilization measures shall be documented and corrected as soon as possible but no more than seven (7) calendar days after the inspection.
    (a) Corrective action documentation shall be stored with the associated site inspection report.
    (b) Immediately take all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events.
    (c) If weather conditions or other issues prevent correction of BMPs within seven calendar days, the reasons for the delay must be documented (this may include pictures) and there must be a narrative explaining why the work cannot be accomplished within the seven day time period. The permittee shall correct the problem as soon as weather conditions or issues allow.
    (d) Corrective actions may be required by the Department. The permittee must comply with any corrective actions required by the Department as a result of permit violations found during an inspection.

V. BMP REQUIREMENTS

1. The information, practices, and BMP requirements in this section shall be implemented on site and, where noted, provided for in the SWPPP.

2. Existing vegetation and trees shall be preserved where practicable. The permittee is encouraged to preserve topsoil where practicable. Trees designated for preservation should have a protective barrier outside of the dripline, or the area directly located under the outer reaches of the tree's branches.

3. The permittee shall select appropriate BMPs for use at the site and list them in the SWPPP. When selecting effective BMPs, the permittee shall consider stormwater volume and velocity and shall incorporate more than one BMP and sequential treatment devices where the use of a single BMP is ineffective to prevent or minimize sediment or other pollutants from leaving the site. Permittee should consider a schedule for performing erosion control measures when selecting BMPs.

4. The SWPPP shall include a description of both structural and non-structural BMPs that will be used at the site.
   (a) The SWPPP shall provide the following general information for each BMP which will be used one or more times at the site:
      1) Physical description of the BMP;
      2) Site conditions that must be met for effective use of the BMP;
      3) BMP installation/construction procedures, including typical drawings; and
      4) Operation and maintenance procedures and schedules for the BMP.
   (b) The SWPPP shall provide the following information for each specific instance where a BMP is to be installed:
      1) Whether the BMP is temporary or permanent;
      2) When the BMP will be installed in relation to each phase of the land disturbance procedures to complete the project; and
      3) Site conditions that must be met before removal of the BMP if the BMP is not a permanent BMP.

5. Structural BMP Installation: The permittee shall ensure all BMPs are properly installed and operational at the locations and relative times specified in the SWPPP.
   (a) Perimeter control BMPs for runoff from disturbed areas shall be installed or existing vegetative areas marked for preservation before general site clearing is started. Note this requirement does not apply to earth disturbances related to initial site clearing and establishing entry, exit, or access of the site, which may require that stormwater controls be installed immediately after the earth disturbance.
   (b) For phased projects, BMPs shall be properly installed as necessary prior to construction activities.
   (c) Stormwater discharges which leave the site from disturbed areas shall pass through an appropriate impediment to sediment movement such as a sedimentation basin, sediment traps (including vegetative buffers), or silt fences prior to leaving the land disturbance site.
   (d) A drainage course change shall be clearly marked on a site map and described in the SWPPP.
   (e) If vegetative stabilization measures are being implemented, stabilization efforts are considered "installed" when all activities

necessary to seed or plant the area are completed. Vegetative stabilization is not considered "operational" until the vegetation is established.

6. Install sediment controls along any perimeter areas of the site that are downgradient from any exposed soil or other disturbed areas. Prevent stormwater from circumventing the edge of the perimeter control. For sites where perimeter controls are infeasible, other practices shall be implemented to minimize discharges to perimeter areas of the site.

7. For surface waters of the state, defined in Section 644.016.1(27) RSMo, located on or adjacent to the site, the permittee must maintain a riparian buffer or structural equivalent in accordance with at least one of the following options. The selection and location must be described in the SWPPP.
   (a) Provide and maintain a 50-foot undisturbed natural buffer; or
   (b) Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer; or
   (c) If infeasible to provide and maintain an undisturbed natural buffer of any size, implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.
   (d) The permittee is not required to comply with (a), (b), or (c) above if one or more of the following exceptions apply and documentation is provided in the SWPPP:
      1) If there is no discharge of stormwater to waters of the state through the area between the disturbed portions of the site and waters of the state located within 50 feet of the site. This includes situations where the permittee has implemented permanent control measures that will prevent such discharges, such as a berm or other barrier.
      2) Where no natural buffer exists due to preexisting development disturbances that occurred prior to the initiation of planning for the current development of the site.
         a. Where some natural buffer exists but portions of the area within 50 feet of the waters of the state are occupied by preexisting development disturbances the permittee is required to comply with (a), (b), or (c) above.
      3) For linear projects where site constraints make it infeasible to implement a buffer or equivalent provided the permittee limit disturbances within 50 feet of any waters of the state and/or the permittee provides supplemental erosion and sediment controls to treat stormwater discharges from earth disturbances within 50 feet of the water of the state. The permittee must also document in the SWPPP the rationale for why it is infeasible for the permittee to implement (a), (b), or (c) and describe any buffer width retained and supplemental BMPs installed.
   (e) Where the permittee is retaining a buffer of any size, the buffer should be measured perpendicularly from any of the following points, whichever is further landward from the water:
      1) The ordinary high water mark of the water body, defined as the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, and/or the presence of litter and debris; or
      2) The edge of the stream or river bank, bluff, or cliff, whichever is applicable.

8. Slopes for disturbed areas must be identified in the SWPPP. A site map or maps defining the sloped areas for all phases of the project must be included in the SWPPP. The disturbance of steep slopes shall be minimized.

9. Manage stockpiles or land clearing debris piles composed, in whole or in part, of sediment and/or soil.
   (a) Locate the piles outside of any natural buffers zones, established under the condition above, and away from any stormwater conveyances, drain inlets, and areas where stormwater flow is concentrated;
   (b) Install a sediment barrier along all downgradient perimeter areas;
   (c) Prevent stormwater flows from causing erosion of stockpiles, for example, by diverting flows around them.
   (d) For piles that will be unused for 14 or more days, provide cover with appropriate temporary stabilization in accordance with Part V. BMP REQUIREMENTS, Condition 13.
   (e) Rinsing, sweeping, or otherwise placing any soil, sediment, debris, or stockpiled product which has accumulated on pavement or other impervious surfaces into any stormwater conveyance, storm drain inlet, or water of the state is prohibited.

10. The site shall include BMPs for pollution prevention measures and shall be noted in the SWPPP. At minimum such measures must be designed, installed, implemented, and maintained to:
   (a) Minimize the discharge of pollutants from equipment and vehicle rinsing; no detergents, additives, or soaps of any kind shall be used. Rinse waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
   (b) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials present on the site to precipitation and to stormwater;
   (c) Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures, including, but not limited to, the installation of containment berms and use of drip pans at petroleum product and liquid storage tanks and containers; and
   (d) Prevent discharges from causing or contributing to an exceedance of water quality standards including general criteria.

11. Sedimentation Basins: The SWPPP shall include a sedimentation basin for each drainage area with ten or more acres disturbed at one time.
    (a) The sedimentation basin shall be sized, at a minimum, to treat a local 2-year, 24-hour storm.
    (b) Sediment basins shall not be constructed in any waters of the state or natural buffer zones.
    (c) Discharges from dewatering activities shall be managed by appropriate controls. The SWPPP shall include a description of any anticipated dewatering methods and specific BMPs designed to treat dewatering water.
        1) Appropriate controls include, but are not limited to, sediment socks, dewatering tanks, tube settlers, weir tanks, filtration systems (e.g. bag or sand filters), and passive treatment systems that are designed to remove or retain sediment.
        2) Erosion controls and velocity dissipation devices (e.g. check dams, riprap, and vegetated buffers) to prevent erosion at inlets, outlets, and discharge points shall be utilized.
        3) Water with an oil sheen shall not be discharged and shall be marked in SWPPP.
        4) Visible floating solids and foam shall not be discharged.
    (d) Until final stabilization has been achieved, sediment basins and impoundments shall utilize outlet structures or floating skimmers that withdraw water from the surface when discharging.
        1) Under frozen conditions, it may be considered infeasible to withdraw water from the surface and an exception can be made for that specific period as long as discharges that may contain sediment and other pollutants are managed by appropriate controls. If determined infeasible due to frozen conditions, documentation must be provided in the SWPPP to support the determination, including the specific conditions or time period when this exception applies.
    (e) Accumulated sediment shall not exceed 25% of total volume or as prescribed in the design, whichever is less. Note in the SWPPP the locations for disposal of the material removed from sediment basins.
    (f) Prevent discharges to the receiving stream causing visual turbidity. For the purposes of this permit, visual turbidity refers to a sediment plume or other cloudiness in the water caused by sediment that can be identified by an observer.
    (g) The SWPPP shall require the basin be maintained until final stabilization of the disturbed area served by the basin.

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

12. Soil disturbing activities on site that have ceased either temporarily or permanently shall initiate stabilization immediately in accordance with the options below. For soil disturbing activities that have been temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days:
    (a) The permittee shall construct BMPs to establish interim stabilization; and
    (b) Stabilization must be initiated immediately and completed within 14 calendar days.
    (c) For soil disturbing activities that have been permanently ceased on any portion of the site, final stabilization of disturbed areas must be initiated immediately and completed within 14 calendar days.
        1) Extension to the 14-day completion period for temporary and final stabilization may be made due to weather and equipment malfunctions. In these circumstances, the justification for the extension to the 14 day shall be documented in the SWPPP. The discontinuation or continuation of the extension may be determined by review of the Department staff when on site.
    (d) Until stabilization is complete, interim sediment control shall consist of well-established and maintained BMPs that are reasonably certain to protect waters of the state from sediment pollution over an extended period of time. This may require adding more BMPs to an area than is normally used during daily operations. The types of BMPs used must be suited to the area disturbed, taking into account the number of acres exposed and the steepness of the slopes. If the slope of the area is greater than 3:1 (three feet horizontal to one foot vertical) 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. The following activities would constitute the immediate initiation of stabilization:
        1) Prepping the soil for vegetative or non-vegetative stabilization as long as seeding, planting, and/or installation of non-vegetative stabilization products takes place as soon as practicable;
        2) Applying mulch or other non-vegetative product to the exposed areas;
        3) Seeding or planting the exposed areas;
        4) Finalizing arrangements to have stabilization product fully installed in compliance with the deadlines for completing stabilization.
    (e) If vegetative stabilization measures are being implemented, stabilization is considered “installed” when all activities necessary to seed or plant the area are completed. Installed does not mean established.
    (f) If non-vegetative stabilization measures are being implemented, stabilization is considered “installed” when all such measures are implemented or applied.
        1) Non-vegetative stabilization shall prevent erosion and shall be chosen for site conditions, such as slope and flow of

stormwater.

(g) Final stabilization is not considered achieved until vegetation has grown and established to meet the requirements below.

13. Prior to removal of BMPs, ceasing site inspections, and requesting termination of the permit, final stabilization must be achieved. Final stabilization shall be achieved as soon as possible once land disturbance activities have ceased. Document in the SWPPP the type of stabilization and the date final stabilization is achieved.
    (a) The project is considered to have achieved final stabilization when perennial vegetation (excluding volunteer vegetation), pavement, buildings, or structures using permanent materials (i.e. riprap, gravel, etc.) cover all areas that have been disturbed. With respect to areas that have been vegetated, vegetation must be at least 70% coverage of 100% of the vegetated areas on site. Vegetation must be evenly distributed.
    (b) Disturbed areas on agricultural land are considered to have achieved final stabilization when they are restored to their preconstruction agricultural use. If former agricultural land is changing to non-agricultural use, this is no longer considered agricultural land and shall follow condition (a).
    (c) If the intended function of a specific area of the site necessitates that it remain disturbed, final stabilization is considered achieved if all of the following are met:
        1) Only the minimum area needed remains disturbed (i.e. dirt access roads, motocross tracks, utility pole pads, areas being used for storage of vehicles, equipment, materials). Other areas must meet the criteria above.
        2) Permanent structural BMPs (rock checks, berms, grading, etc.) or non-vegetative stabilization measures are implemented and designed to prevent sediment and other pollutants from entering waters of the state.
        3) Inspection requirements in Part IV. SWPPP MANAGEMENT REQUIREMENT, Condition 11 are met and documented in the SWPPP.
    (d) Winter weather and frozen conditions do not excuse any of the above final stabilization requirements. If vegetation is required for stabilization the permittee must maintain BMPs throughout winter weather and frozen conditions until thawing and vegetation meets final stabilization criteria above. Document stabilization attempts during frozen conditions in the SWPPP. Consider future freezing when removing vegetation and plan with temporary stabilization techniques before the ground becomes frozen.

VI. PERMIT TERMINATION

1. Until the permittee terminates coverage under this permit, the permittee must comply with all conditions in the permit, including continuation of site inspections and public notification signage posted. To terminate permit coverage, the permittee must submit to the appropriate Regional Office a complete and accurate Request for Termination of Operating Permit which certifies that the site meets the following requirements:
    (a) For any areas that (1) were disturbed during construction, (2) are not covered over by permanent structures, and (3) over which the permittee had control during the construction activities, the requirements for final vegetative or non-vegetative stabilization in Part V BMP REQUIREMENTS, Condition 13;
    (b) The permittee has removed and properly disposed of all construction materials, waste, and waste handling devices and has removed all equipment and vehicles that were used during construction, unless intended for long-term use following termination of permit coverage;
    (c) The permittee has removed all temporary BMPs that were installed and maintained during construction, except those that are intended for long-term use following termination of permit coverage or those that are biodegradable; and
    (d) The permittee has removed all potential pollutants and pollutant-generating activities associated with construction, unless needed for long-term use following termination of permit coverage.

    The Department may request photographs that clearly document compliance with termination requirements.

2. The permit may be terminated if;
    (a) There has been a transfer of control of all areas of the site for which the current permittee is responsible under this permit to another operator, and that operator has obtained coverage under this permit; or
    (b) Coverage under an individual or alternative general NPDES permit, with land disturbance conditions, has been obtained.

VII. SAMPLING REQUIREMENTS

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

VIII. STANDARD PERMIT CONDITIONS

1. Records: The permittee shall retain copies of this general permit, the SWPPP and all amendments for the site named in the State Operating Permit, results of any monitoring and analysis, and all site inspection records required by this general permit.
   (a) The records shall be accessible during normal business hours and retained for a period of at least three (3) years from the date of termination.
   (b) The permittee shall provide a copy (electronic or otherwise) of the SWPPP to the Department, USEPA, or any local agency or government representative if they request a copy in the performance of their official duties within 24 hours of the request (or next working day), unless given more time by the representative.
   (c) The permittee shall provide a copy of the SWPPP to those who are responsible for installation, operation, or maintenance of any BMP. The permittee, their representative, and/or the contractor(s) responsible for installation, operation and maintenance of the BMPs shall have a current copy of the SWPPP with them when on the project site.

2. Land Ownership and Change of Ownership: Federal and Missouri stormwater regulations [10 CSR 20-6.200(1) (B)] require a stormwater permit and erosion control measures for all land disturbances of one or more acres. These regulations also require a permit for land disturbance sites less than one acre if the lot is part of a larger common plan of development or sale.
   (a) 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.
   (b) Property of any size which is part of a larger common plan of development where the property has achieved final stabilization and the original permit terminated will require application of a new land disturbance permit for any future land disturbance activity unless the activity is by an individual residential building lot owner on a site less than one acre.
   (c) If a portion of a larger common plan of development is sold to an individual for the purpose of building his or her own private residence, a permit is required if the disturbed portion of the land sold is equal to or greater than one acre. No permit is required, however, for less than one acre of land disturbed on the portion sold.

3. Permit Transfer: This permit may not be transferred to a new owner in any fashion except by submitting an Application for Transfer of Operating Permit signed by the seller and buyer of the site along with the appropriate modification fee. In some cases, revocation and reissuance may be necessary. Facilities that undergo transfers of ownership without notice to the Department are considered to be operating without a permit.

4. Termination: This permit may be terminated when the project has achieved final stabilization, defined in Part VI. PERMIT TERMINATION.
   (a) In order to terminate the permit, the permittee shall notify the Department by submitting the form Request for Termination of Operating Permit Form MO 780-2814. The form should be submitted to the appropriate Regional Office or through an approved electronic system if it should become available.
   (b) The Cover Page (Certificate Page) of the Master General Permit for Land Disturbance specifies the “effective date” and the “expiration date” of the Master General Permit. The “issued date” along with the “expiration date” will appear on the State Operating Permit issued to the applicant. **This permit does not continue administratively beyond the expiration date.**

5. Duty to Reapply: If the project or development completion date will be after the expiration date of this general permit, then the permittee must reapply to the Department for a new permit. This permit may be applied for and issued electronically in accordance with Section 644.051.10, RSMo.
   (a) Due to the nature of the electronic permitting system, a period of time may be granted at the discretion of the Department in order to apply for a new permit after the new version is effective. Applicants must maintain appropriate best management practices and inspections during the discretionary period.

6. Duty to Comply: The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Missouri Clean Water Law and Federal Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

7. Modification, Revocation, and Reopening:
   (a) If at any time the Department determines that the quality of waters of the state may be better protected by reopening this permit, or revoking this permit and requiring the owner/operator of the permitted site to apply for a site-specific permit, the Department may revoke a general permit and require any person to obtain such an operating permit as authorized by 10 CSR20-6.010(13) and 10 CSR 20-6.200(1)(B).

(b) If this permit is reopened, modified, or revoked pursuant to this Section, the permittee retains all rights under Chapter 536 and 644 Revised Statutes of Missouri upon the Department's reissuance of the permit as well as all other forms of administrative, judicial, and equitable relief available under law.

8. Other Information: Where the permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.

9. Duty to Provide Information: The permittee shall furnish to the Department, within 24 hours unless explicitly granted more time in writing, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Department upon request, copies of records required to be kept by this permit.

10. Inspection and Entry: The permittee shall allow the Department, or an authorized representative (including an authorized contractor acting as a representative of the Department), upon presentation of credentials and other documents as may be required by law, to:
    (a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of the permit;
    (b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
    (c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
    (d) Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Federal Clean Water Act or Missouri Clean Water Law, any substances or parameters at any location.

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

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

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

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

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

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 five (5) years unless otherwise specified.

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

DEFINITIONS FOR THE PURPOSES OF THIS PERMIT:

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

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

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

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

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

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

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

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

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

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

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

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

Non-structural BMP: Institutional, educational, or pollution prevention practices designed to limit the amount of stormwater runoff or

pollutants that are generated in the landscape. Examples of non-structural BMPs include picking up trash and debris, sweeping up nearby sidewalks and streets, maintaining equipment, and training site staff on stormwater control practices.
Operational: for the purposes of this permit, stormwater controls are made "operational" when they have been installed and implemented, are functioning as designed, and are properly maintained.

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

Outfall: For the purposes of this permit, outfalls are locations where stormwater exits the site property, including pipes, ditches, swales, channels, or other conduits that transport stormwater discharges associated with the construction activity.

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

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

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

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

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

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

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

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

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

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

EXAMPLES OF TYPES; BUT NOT LIMITED TO'S:

Building materials and building products typically present at constructions sites: Asphalt sealants, copper flashing, roofing materials, adhesives, concrete admixtures, and gravel and mulch stockpiles

Construction and domestic (solid) waste: Packaging materials, scrap construction materials, masonry products, timber, pipe and electrical cuttings, plastics, Styrofoam, concrete, demolition debris, and other trash or building materials.

Hazardous or toxic waste that may be present at construction sites: Caulks, sealants, fluorescent light ballasts (mercury), solvents, petroleum-based products, wood preservatives, additives, curing compounds, and acids.

Pollutant-generating activities: Paving operations; concrete, paint, and stucco washout and waste disposal; solid waste storage and disposal; and dewatering activities.

Types of pollutants typically found at constructions sites: Sediment; nutrients; heavy metals; pesticides and herbicides; oil and grease; bacteria and viruses; trash, debris, and solids; treatment polymers; and any other toxic chemicals.

BMPs for Erosion Control: Temporary/permanent seeding, hydroseeding, mulch and hydromulch, erosion control blankets, dust control, sodding, slope protection, and preservation of existing vegetation.

BMPs for Sediment Control: Fabric drop inlet protection, excavated drop inlet protection, block and gravel inlet protection, domed inlet protection, inlet bag or insert, silt fence, temporary diversion, right-of-way/diversion bar, temporary slope drain, subsurface drain, rock outlets, berms, filter socks, transition mats, temporary sediment trap, energy dissipaters, rock check dam, ditch checks, wattles, straw bale barrier, vegetative buffer strip, sediment basin, particle curtains, frog logs, and dispersion fields.

ePermitting for Land Disturbance

In order to apply for the states MO-RA land disturbance permit you will need to utilize the Department's online ePermitting system. In order to access this, you will need to register an account with the Missouri Gateway for Environmental Management (MoGEM). The following user guides will assist you with this process.

MoGEM Website:https://dnr.mo.gov/data-e-services/missouri-gateway-environmental-management-mogem
ePermitting Website: https://dnr.mo.gov/data-e-services/water/electronic-permitting-epermitting
How to Register: https://dnr.mo.gov/document-search/registering-new-user-account-within-missouri-gateway-environmental-management-mogem-portal
ePermitting User Guides: (found on ePermitting website)

- How to Add a Facility: https://dnr.mo.gov/document-search/epermitting-chapter-2-home-facility-search-associate-new-facility
- How to Apply for a Permit: https://dnr.mo.gov/document-search/epermitting-chapter-3-create-new-permit.

Part I – Basic Permit Information

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

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

Land disturbance activities include clearing, grubbing, excavating, grading, filling and other activities that result in the destruction of the root zone and/or other activities that are reasonably certain to cause pollution to waters of the state.

A Missouri State Operating Permit for land disturbance permit is required for construction disturbance activities of one or more acres, or for construction activities that disturb less than one acre when they are part of a larger common plan of development or sale that will disturb a cumulative total of one or more acres over the life of the project per 10CSR 20-6.200(1)(D)28.

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

When it precipitates, stormwater washes over the loose soil on a construction site and various other materials and products being stored outside. As stormwater flows over the site, it can pick up pollutants like sediment, debris, and chemicals from the loose soil and transport them to nearby storm sewer systems or directly into rivers, lakes, or coastal waters. The Missouri Department of Natural Resources is responsible for ensuring that construction site operators have the proper stormwater controls in place so that construction can proceed in a way that protects your community's clean water and the surrounding environment. One way the department helps protect water quality is by issuing land disturbance permits.

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

CHANGES TO THE RENEWAL OF THIS PERMIT INCLUDE:
While drafting this permit for renewal, the Department hosted three public meetings held on January 27, February 17, and March 9, 2021, which allowed stakeholders to voice concerns about conditions within the permit and submit comments during the period of initial stakeholder involvement. These concerns were taken into consideration when drafting the permit. In addition to these meetings, the Department also held an informal review period for stakeholders to review the draft prior to the 30 day public comment period.

- Updated language throughout the permit to current permit language used by the Department and EPA.
- Added language for emergency related projects.
- Clarified conditions which were ambiguous.
- Reorganized sections/conditions for logical progression.
- Authorized permit transfers and some modifications.
- Sections added for termination procedures, discharges to special streams, and procedures for concrete washout.

PART II – RECEIVING STREAM INFORMATION

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

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

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

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

RECEIVING STREAM MONITORING REQUIREMENTS:
There are no receiving water monitoring requirements recommended at this time.

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

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

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

ANTI-BACKSLIDING:

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

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

ANTIDEGRADATION:

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

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

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

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

BENCHMARKS:

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

✓ Not applicable; this facility has stormwater-only outfalls and does not contain numeric benchmarks.

BEST MANAGEMENT PRACTICES:

Minimum site-wide BMPs are established in this permit to ensure all permittees are managing their sites equally to protect waters of the state from certain activities which could cause negative effects in receiving water bodies. If the minimum BMPs are not followed, the facility may violate general criteria [10 CSR 20-7.031(4)]. Statutes are applicable to all permitted facilities in the state; therefore, pollutants cannot be released unless in accordance with RSMo 644.011 and 644.016 (17).

During a short time period, construction sites can contribute more sediment to streams than can be deposited naturally during several decades. The resulting siltation and contribution of other pollutants from construction sites can cause physical, chemical, and biological harm to Missouri's waters. Land disturbance activities, such as clearing and grading the land surface, increases the potential for sediment discharges.

The previous version of this permit contained the majority of the BMPs required in this permit and were found to protect water quality. Additional BMPs were added to improve protections with language taken from the EPA's Construction General Permit.

Language was added for track out to clarify and to combine with the roadway conditions in the previous permit. Preventing sediment from entering roadway inlets will protect water quality. Requirements were added for concrete wash out management. This is a common activity on construction sites which had not been address in the previous permit. Containment of the wash out water will protect waters of the state. This language was adopted from the EPAs Construction General Permit.

This renewal requires certain operators be listed in the SWPPP, this was added to ensure all responsible parties are known to the staff on site in the event there is an environmental issue that needs attention.

Inspection conditions were added to clarify what parts of the site to inspect. By inspecting areas prone to pollution, such as material storage, or location where pollutants are like to leave the site, such as the outfall, there is increased protections to water quality by stopping pollutants before leaving the site, or correcting an issue quickly.

Inspection frequencies were reduced for areas where stabilization has been achieved. It was the permit writer's judgement that stabilized areas do not require inspections at the same frequency as active areas of a site as the stabilization is a BMP to reduce sediment loss. Additional inspections are required for sediment basin dewatering activities during times of dewatering. These activities

open the possibility for high volumes of sediment to be discharged into the receiving waters. By inspecting the discharge, the waters shall be better protected. Language was added to add the temporary reduction of inspections for areas that have frozen ground.

Condition was added for stockpile management to add clarity for operators on site. Migration of soil or product from mis-managed piles can enter waters of the state and cause water quality violations. Conditions were added to sediment basin dewater to increase the protection of receiving waters by increasing controls to retain sediment and keep it out of the discharged water.

Language was added to include National and State Resource Waters with added protections. Language for this was taken from the template for Missouri General Permits. These requirements also include waters with impairments for sediment, the pollutant of concern under this permit. Extra protections in these special stream requirements were added to clarify the discharges must be stormwater only.

Language was added to include the encouragement of preserving vegetation, trees, and soil. Clearing reduces the natural uptake of water and nutrients by vegetation and excessive grading can smooth the ground surface, increasing amount and velocity of runoff. Vegetation inhibits erosion as the roots hold the topsoil in place, while leaves protect the surface against rain. Once the vegetative cover is gone, erosion is accelerated. The longer the exposed area is subject to erosive forces, the more severe the effect. Clarification was added to define voluntary vegetation and to explain that these shallow rooted short-lived vegetation is not allowed as permanent stabilization.

CHANGES IN DISCHARGES OF TOXIC POLLUTANT:
This special condition reiterates the federal rules found in 40 CFR 122.44(f) and 122.42(a)(1). In these rules, the facility is required to report changes in amounts of toxic substances discharged. Toxic substances are defined in 40 CFR 122.2 as "…any pollutant listed as toxic under section 307(a)(1) or, in the case of "sludge use or disposal practices," any pollutant identified in regulations implementing section 405(d) of the CWA." Section 307 of the clean water act then refers to those parameters found in 40 CFR 401.15. The permittee should also consider any other toxic pollutant in the discharge as reportable under this condition.

DOMESTIC WASTEWATER, SLUDGE, AND BIOSOLIDS:
Domestic wastewater is defined as wastewater (i.e., human sewage) originating primarily from the sanitary conveyances of bathrooms and kitchens. Domestic wastewater excludes stormwater, animal waste, process waste, and other similar waste.

- ✓ Not applicable; this permit does not authorize discharge of domestic waste, sludge, or biosolids. This includes discharges to onsite lagoons. If a facility has an onsite lagoon, they may need to obtain a separate general or site specific permit to cover discharges or land application from this structure.

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

- ✓ Not applicable; this permit does not authorize discharge or land application of biosolids or sludge. A separate permit must be obtained for these activities, either general or site specific.

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

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

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

- ✓ Not applicable; this permit has no limits to report.

GENERAL CRITERIA CONSIDERATIONS:
In accordance with 40 CFR 122.44(d)(1), effluent limitations shall be placed into permits for pollutants determined to cause, have reasonable potential to cause, or to contribute to, an excursion above any water quality standard, including narrative water quality criteria. In order to comply with this regulation, the permit writer has completed a reasonable potential determination on whether

discharges have reasonable potential to cause or contribute to an excursion of the general criteria listed in 10 CSR 20-7.031(4). In instances where reasonable potential exists, the permit includes limitations within the permit to address the reasonable potential. In discharges where reasonable potential does not exist, the permit may include monitoring to later determine the discharge's potential to impact the narrative criteria. Additionally, RSMo 644.076.1, as well as Standard Permit Conditions Part VIII of this permit state it shall be unlawful for any person to cause or allow any discharge of water contaminants from any water contaminant or point source located in Missouri in violation of sections 644.006 to 644.141 of the Missouri Clean Water Law or any standard, rule, or regulation promulgated by the commission.

LAND APPLICATION:
Land application, or surficial dispersion of wastewater and/or sludge, is performed by facilities to maintain a basin as no-discharge. Requirements for these types of operations are found in 10 CSR 20-6.015; authority to regulate these activities is from RSMo 644.026.
- ✓ Not applicable; this permit does not authorize operation of a surficial land application system to disperse wastewater or sludge.

LAND DISTURBANCE:
Land disturbance, sometimes called construction activities, are actions which cause disturbance of the root layer or soil; these include clearing, grading, and excavating of the land. 40 CFR 122.26(b)(14) and 10 CSR 20-6.200(3) requires permit coverage for these activities. Coverage is not required for facilities when only providing maintenance of original line and grade, hydraulic capacity, or to continue the original purpose of the facility.
- ✓ Applicable; this permit provides coverage for land disturbance activities. These activities have SWPPP requirements and may be combined with the standard site SWPPP. Land disturbance BMPs should be designed to control the expected peak discharges. The University of Missouri has design storm events for the 25 year 24 hour storm; these can be found at: http://ag3.agebb.missouri.edu/design_storm/comparison_reports/20191117_25yr_24hr_comparison_table.htm; to calculate peak discharges, the website https://www.lmnoeng.com/Hydrology/rational.php has the rational equation to calculate expected discharge volume from the peak storm events.

NUTRIENT MONITORING:
Nutrient monitoring is required for facilities characteristically or expected to discharge nutrients (nitrogenous compounds and/or phosphorus) when the design flow is equal to or greater than 0.1 MGD per 10 CSR 20-7.015(9)(D)8.
- ✓ This is a stormwater only permit; therefore, it is not subject to provisions found in 10 CSR 20-7.015 per 10 CSR 20-7.015(1)(C).

OIL/WATER SEPARATORS:
Oil water separator (OWS) tank systems are frequently found at industrial sites where process water and stormwater may contain oils and greases, oily wastewaters, or other immiscible liquids requiring separation. Food industry discharges typically require pretreatment prior to discharge to municipally owned treatment works. Per 10 CSR 26-2.010(2)(B), all oil water separator tanks must be operated according to manufacturer's specifications and authorized in NPDES permits per 10 CSR 26-2.010(2) or may be regulated as a petroleum tank.
- ✓ Not applicable; this permit does not authorize the operation of OWS. The facility must obtain a separate permit to cover operation of and discharge from these devices.

OPERATOR CERTIFICATION REQUIREMENTS:
As per 10 CSR 20-6.010(8) Terms and Conditions of a Permit, permittees shall operate and maintain facilities to comply with the Missouri Clean Water Law and applicable permit conditions and regulations. Operators or supervisors of operations at regulated wastewater treatment facilities shall be certified in accordance with [10 CSR 20-9.020(2)] and any other applicable state law or regulation.
- ✓ Not applicable; the facilities covered under this permit are not required to have a certified operator.

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

PRETREATMENT PROGRAM:
This permit does not regulate pretreatment requirements for facilities discharging to an accepting permitted wastewater treatment facility. If applicable, the receiving entity (the publicly owned treatment works - POTW) must ensure compliance with any effluent

limitation guidelines for pretreatment listed in 40 CFR Subchapter N per 10 CSR 20-6.100. Pretreatment regulations per RSMo 644.016 are limitations on the introduction of pollutants or water contaminants into publicly owned treatment works or facilities.

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

PUBLIC NOTICE OF COVERAGE FOR AN INDIVIDUAL FACILITY:

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

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

REASONABLE POTENTIAL ANALYSIS (RPA):

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

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

SCHEDULE OF COMPLIANCE (SOC):

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

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

SETBACKS:

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

✓ Discharge to the watersheds of a Metropolitan No-Discharge Stream (10 CSR 20-7.031 Table F) is authorized by this permit if the discharges are in compliance with 10 CSR 20-7.015(5) and 10 CSR 20-7.031(7). Discharges to these watersheds are authorized for uncontaminated stormwater discharges only.

✓ This permit authorizes stormwater discharges which are located in a way to allow water to be released into sinkholes, caves, fissures, or other openings in the ground which could drain into aquifers (except losing streams) per 10 CSR 20-7.015(7). It is the best professional judgment of the permit writer to allow discharges to losing streams as the effluent is stormwater only.

✓ This permit authorizes stormwater discharge in the watersheds of Outstanding state Resource Waters (OSRW); Outstanding National Resources Waters (ONRW), which includes the Ozark National Riverways and the National Wild and Scenic Rivers System; and impaired waters as designated in the 305(b) report, including the 303(d), list so long as no degradation of water quality occurs in the OSRW and ONRW due to discharges from the permitted facility per 10 CSR 20-7.015(6)(B) and 10 CSR 20-7.031(3)(C).

Additionally, if the facility is found to be causing degradation or contributing to an impairment by discharging a pollutant of concern during an inspection or through complaint investigations, they will be required to become a no discharge facility or obtain a site specific permit with more stringent monitoring and SWPPP requirements. Missouri's impaired waters can be found at https://dnr.mo.gov/water/what-were-doing/water-planning/quality-standards-impaired-waters-total-maximum-daily-

loads/impaired-waters. Sites within 1000 feet of a OSRW, ONRW, or water impaired for sediment must operate as a no-discharge facility. These additional protections are borrowed from the USEPA 2021 draft Construction General Permit.

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

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

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

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

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

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

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

A SWPPP must be prepared if the SIC code for the facility is found in 40 CFR 122.26(b)(14) and/or 10 CSR 20-6.200(2). A SWPPP may be required of other facilities where stormwater has been identified as necessitating better management. The purpose of a SWPPP is to comply with all applicable stormwater regulations by creating an adaptive management plan to control and mitigate stream pollution from stormwater runoff. Developing a SWPPP provides opportunities to employ appropriate BMPs to minimize the risk of pollutants being discharged during storm events. The following paragraph outlines the general steps the permittee should take to determine which BMPs will work to achieve the benchmark values or limits in the permit. This section is not intended to be all encompassing or restrict the use of any physical BMP or operational and maintenance procedure assisting in pollution control. Additional steps or revisions to the SWPPP may be required to meet the requirements of the permit.

Areas which should be included in the SWPPP are identified in 40 CFR 122.26(b)(14). Once the potential sources of stormwater pollution have been identified, a plan should be formulated to best control the amount of pollutant being released and discharged by each activity or source. This should include, but is not limited to, minimizing exposure to stormwater, good housekeeping measures, proper facility and equipment maintenance, spill prevention and response, vehicle traffic control, and proper materials handling. Once a plan has been developed, the facility will employ the control measures determined to be adequate to prevent pollution from entering waters of the state. The facility will conduct inspections of the BMPs to ensure they are working properly and re-evaluate any BMP

not achieving compliance with permitting requirements. For example if the BMP being employed is deficient in controlling stormwater pollution, corrective action should be taken to repair, improve, or replace the failing BMP. If failures do occur, continue this trial and error process until appropriate BMPs have been established.

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

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

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

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

UNDERGROUND INJECTION CONTROL (UIC):

The UIC program for all classes of wells in the State of Missouri is administered by the Missouri Department of Natural Resources and approved by EPA pursuant to section 1422 and 1425 of the Safe Drinking Water Act (SDWA) and 40 CFR 147 Subpart AA. Injection wells are classified based on the liquids which are being injected. Class I wells are hazardous waste wells which are banned by RSMo 577.155; Class II wells are established for oil and natural gas production; Class III wells are used to inject fluids to extract minerals; Class IV wells are also banned by Missouri in RSMo 577.155; Class V wells are shallow injection wells; some examples are heat pump wells and groundwater remediation wells. Domestic wastewater being disposed of sub-surface is also considered a Class V well. In accordance with 40 CFR 144.82, construction, operation, maintenance, conversion, plugging, or closure of injection wells shall not cause movement of fluids containing any contaminant into Underground Sources of Drinking Water (USDW) if the presence of any contaminant may cause a violation of drinking water standards or groundwater standards under 10 CSR 20-7.031 or other health-based standards or may otherwise adversely affect human health. If the Department finds the injection activity may endanger USDWs, the Department may require closure of the injection wells or other actions listed in 40 CFR 144.12(c), (d), or (e). In accordance with 40 CFR 144.26, the permittee shall submit a Class V Well Inventory Form for each active or new underground injection well drilled, or when the status of a well changes, to the Missouri Department of Natural Resources, Geological Survey Program, P.O. Box 250, Rolla, Missouri 65402. Single family residential septic systems and non-residential septic systems used solely for sanitary waste and having the capacity to serve fewer than 20 persons a day are excluded from the UIC requirements (40 CFR 144.81(9)).

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

VARIANCE:

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

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

WASTELOAD ALLOCATIONS (WLA) FOR LIMITATIONS:

Per 10 CSR 20-2.010(78), the amount of pollutant each discharger is allowed by the Department to release into a given stream after the Department has determined total amount of pollutant which may be discharged into the stream without endangering its water quality. Water quality based maximum daily and average monthly effluent limitations were calculated using methods and procedures

outlined in USEPA's Technical Support Document For Water Quality-based Toxics Control (TSD) (EPA/505/2-90-001).
✓ Not applicable; water quality limitations were not applied in this permit.

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

WHOLE EFFLUENT TOXICITY (WET) TEST:
Per 10 CSR 20-7.031(1)(FF), a toxicity test conducted under specified laboratory conditions on specific indicator organism; and per 40 CFR 122.2, the aggregate toxic effect of an effluent measured directly by a toxicity test. A WET test is a quantifiable method of determining if a discharge from a facility may be causing toxicity to aquatic life by itself, in combination with, or through synergistic responses when mixed with receiving water.
✓ Not applicable: At this time, permittees are not required to conduct a WET test. This permit is for stormwater only.

PART IV – EFFLUENT LIMITATIONS DETERMINATION

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

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

PART V–REPORTING REQUIREMENTS

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

REPORTING:
There are no reporting requirements for MO-RAxxxxx land disturbance permits. Land disturbance information is best reviewed on an as requested basis and this permit established documents requirements that allow the Department to request and receive needed documentation prior to, during, or after site inspections.

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

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

1) The design, installation, and maintenance of effective erosion and sediment controls to minimize the discharge of pollutants. These erosion and sediment controls must be designed to capture or treat a 2-year, 24-hour storm event. This includes BMPs and, depending on the acreage of the drainage area, sediment basins.

2) If the seven-day inspection frequency is utilized, an inspection must occur within 48 hours after any storm event equal to or greater than a 2-year, 24 hour storm has ceased.

A 2-year, 24-hour storm event may be determined in two different ways. For site-specific 2-year, 24-hour storm event information utilize the National Oceanic and Atmospheric Administration's National Weather Service Atlas 14 (NOAA Atlas 14) which is located at https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html. This is the most accurate and preferred method for determining the 2-

year, 24-hour storm event. In general, this will be the least stringent method. For more information visit; https://www.weather.gov/media/owp/oh/hdsc/docs/Atlas14_Volume8.pdf.

As an alternative to NOAA Atlas 14, a default value may be utilized. The map below provided by the Department represent the most conservative, protective values for default values applicable to Missouri. In general, this will be the most stringent method. This map is based on Technical Paper No. 40 (TP-40). TP-40 provides a map of the continental U.S. for the 2-year, 24-hour storm event. See map below for default values.

Map 1: Default Values for 2-Year, 24-Hour Storm Event for Design of Sediment and Erosion Controls

Legend: Northern Counties (blue): 3.5 inches
Southern Counties (grey): 4 inches

Surface Water Buffer Zones: In order to design controls that match the sediment removal efficiency of a 50-foot buffer, you first need to know what this efficiency is for your site. The sediment removal efficiencies of natural buffers vary according to a number of site-specific factors, including precipitation, soil type, land cover, slope length, width, steepness, and the types of erosion and sediment controls used to reduce the discharge of sediment prior to the buffer. For additional information; https://www.epa.gov/sites/default/files/2017-02/documents/2017_cgp_final_appendix_g_-_buffer_reqs_508.pdf

PART VII – ADMINISTRATIVE REQUIREMENTS

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

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

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

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

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

- ✓ The Public Notice period for this permit was held from November 5, 2021 and ends December 6, 2021. Two letters were received during the 30 day Public Notice period. The summarized comments from the letter and the Department's responses to the comments are below and are in reference to the Public Noticed version of this permit. The comments and responses to the Public Notice of this permit do not warrant the modification of the terms and conditions of this permit.

  Letter 1:
  Comment #1: Numbering on Page 3 - **there are two #2's**
  Response: Thank you, this was corrected.
  Comment #2: 2. … If an individual proposes to develop a lot to reside on (**themself**),
  Response: This word has been added to add clarity.
  Comment #3: Table on Page 3, I. Applicability Section A, #2. The second row, second column is confusing. This second part seems to imply that lots less than 1 acre but not part of a common plan would need a permit if the lot is to be sold. This seems contrary to the one or more acres required for a permit.
  Response: The second part was reworded in effort to clarify. The "or if" was changed to "including" to clarify both situations are part of the common plan and would require a permit.
  Comment #4: The first part of this section before the semicolon seems incomplete:
  Response: The redundant wording was removed to clarify this condition.
  Comment #5: There is no #3.
  Response: Thank you, this was corrected.
  Comment #6: Number 4. Could the impaired water also be on the 303(d) list? Impaired waters are only on the 305(b) list after they have a TMDL written. What about the streams on the 303(d) list that are waiting for a TMDL?
  Response: The 303(d) list is a less-encompassing component of the all-encompassing 305(b) Report. The permit has been edited to state "designated in the 305(b) Report, including the 303(d) list," to emphasizing the 303(d) list.
  Comment #7: 10. Change the word States to state
  Response: This was corrected.
  Comment #8: There are 2 (b)s under #1. 1(c). Part VII. should be Part VIII STANDARD PERMIT CONDITIONS
  6. Replace the period with a colon after BMPs. "The permittee shall select, install, use, operate and maintain appropriate BMPs for the permitted site. The following manuals are acceptable resources for the selection of appropriate BMPs:"
  Response: These corrections were made.
  Comment #9: 11(b) 2 and 3. These are missing periods after the word "holiday"
  Response: These corrections were made.
  Comment #10: V. BMP Requirements (2) Can you define "dripline"
  Response: A longer explanation of "dripline" was added to that condition for clarity.
  Comment #11: 11.(c)(2) Is this missing a word after "from". In the phrase "discharge points from" ? Perhaps just remove the word "from". The phrase would read "inlets, outlets, and discharge points shall be utilized."
  Response: This correction has been made.
  Comment #12: Also, the addition of language related to BMPs discussed on page 5 and 6 of the fact sheet are positive additions to the permit and should help guide protection of waters of the state from sediment.
  On the top of page 6 of the fact sheet, it appears there is a typo: " Migration of soil or product from mis-managed **plies"**
  Response: This correction has been made.

  Letter 2:
  Comment #1: Define Outfalls.
  Response: Outfalls are points with discharges of stormwater from areas associated with the industrial activity for which the facility is permitted; in this case construction. Discerning if certain drains which leave the site would be considered an outfall or not would be specific to each site, in addition to the specific phase of construction. Outfalls on construction sites are often not stationary. An outfall does not need to be a pipe, it can be a ditch, channel, or other conduit that discharges stormwater off the property, and there is no size constraint to outfalls. A definition has been added to the fact sheet to add clarification.
  Comment #2: I. Applicability: A. Permit Coverage and Authorized Discharges – Permit numbering is off.
  Response: Thank you, this has been corrected.
  Comment #3: **I. Applicability: B. Permit Restrictions** – Permit numbering is off**.**
  Response: Thank you, this has been corrected.
  Comment #4: 4(c) Discharges from dewatering of sedimentation basins is prohibited. Does this mean direct dumping of dewatering material? Are dewatering controls such as sediment bags, infiltration trenches, or buffer strips allowed?
  Response: The definition of no-discharge facility found in 10 CSR 20-6.015 includes the condition "To hold or irrigate, or otherwise dispose without discharge to surface or subsurface waters of the state, all process wastes and associated storm water flows except for discharges that are caused by catastrophic and chronic storm events;". Dewatering controls are allowed so long as they are operated so that the dewatered material and water is not discharged to waters of the state.
  Comment #5: 4(c) references 10 CSR 20-6.15(1)B(7). Should this be 10 CSR 20-6.015(1)B(7)?
  Response: This has been corrected, thank you.
  Comment #6: Could the department please clarify what is meant by a "catastrophic event" referenced in this regulation? The

permit design standards are for the 2-year, 24-hour storm.
Response: Catastrophic storm is defined in 10 CSR 20-6.015(1)(B)2 as "A precipitation event of twenty-four (24)-hour duration or less that exceeds the twenty-five (25)-year, twenty-four (24)-hour storm event." A chronic storm event is defined in 10 CSR 20-6.015(1)(B)3 as "A precipitation event with a duration of more than twenty-four (24) hours that exceeds the one-in-ten (1 in 10)-year return frequency."
This information is found on the National Oceanic and Atmospheric Administration's National Weather Service Atlas 14. A link can be found in the permit part **III. REQUIREMENTS** 4.
Comment #7: IV. SWPPP Management Requirements 1. Multilevel numbering is off.
Response: This has been corrected, thank you.
Comment #8: **VIII. Standard Permit Conditions 2. Land Ownership and Change of Ownership** 2(c) – Please clarify if an individual needs a land disturbance permit for their personal residence if the portion of land sold is equal to or greater than one acre, as it states in the proposed permit, or only if they will be disturbing one acre or greater.
Response: The word 'disturbed' has been included in this portion to add clarity.

DATE OF FACT SHEET: 10/13/2021

COMPLETED BY:

SARAH WRIGHT
ENVIRONMENTAL SPECIALIST
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
OPERATING PERMITS SECTION - STORMWATER AND CERTIFICATION UNIT
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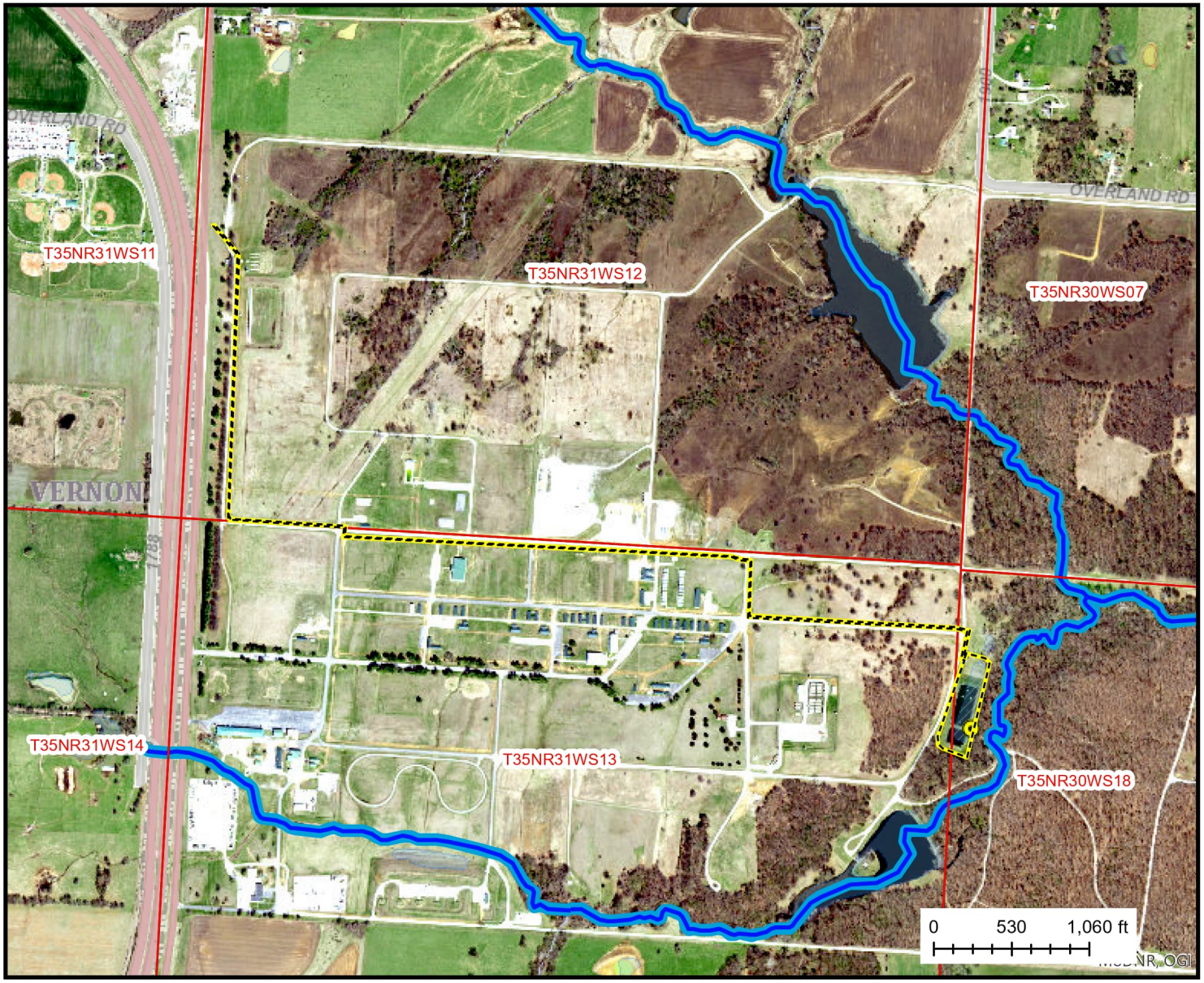
Sarah.wright@dnr.mo.gov, dnr.generalpermits@dnr.mo.gov

DNR_Landscape



Legend

- Land Disturbance Point
- Land Disturbance Area
- 12 Digit Watershed Boundaries
- Impaired Streams - 303(d)
- Impaired Lakes - 303(d)
- Stream Classifications and Use Designations
- Lake Classifications and Use Designations
- Public Land Survey System
- Interstates and U.S. highways
- State numbered routes
- State letttered routes
- ramps
- Major roads
- Minor roads
- Railroads
- County Boundaries
- Lake or Pond
- Lake or Pond / Intermittent
- Lake or Pond / Perennial
- Reservoir
- Swamp or Marsh
- Other; Artificial Path
- Canal or Ditch
- Stream or River
- Stream or River / Intermittent
- Stream or River / Perennial
- Municipalities Boundary
- Municipalities Fill

Printed: January 23, 2024

PUBLIC NOTIFICATION SIGN

MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

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

_____

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

1-800-361-4827

MISSOURI DEPARTMENT OF NATURAL RESOURCES
Division of Environmental Quality Regional Offices

Kansas City Area

Kansas City Regional Office
500 NE Colbern Rd.
Lee's Summit, MO 64086-4710
816-251-0700 FAX: 816-622-7044

St. Louis Area

St. Louis Regional Office
7545 S. Lindbergh, Ste 210
St. Louis, MO 63125
314-416-2960 FAX: 314-416-2970

Northeast Area

Northeast Regional Office
1709 Prospect Drive
Macon, MO 63552-2602
660-385-8000 FAX: 660-385-8090

Southwest Area

Southwest Regional Office
2040 W. Woodland
Springfield, MO 65807-5912
417-891-4300 FAX: 417-891-4399

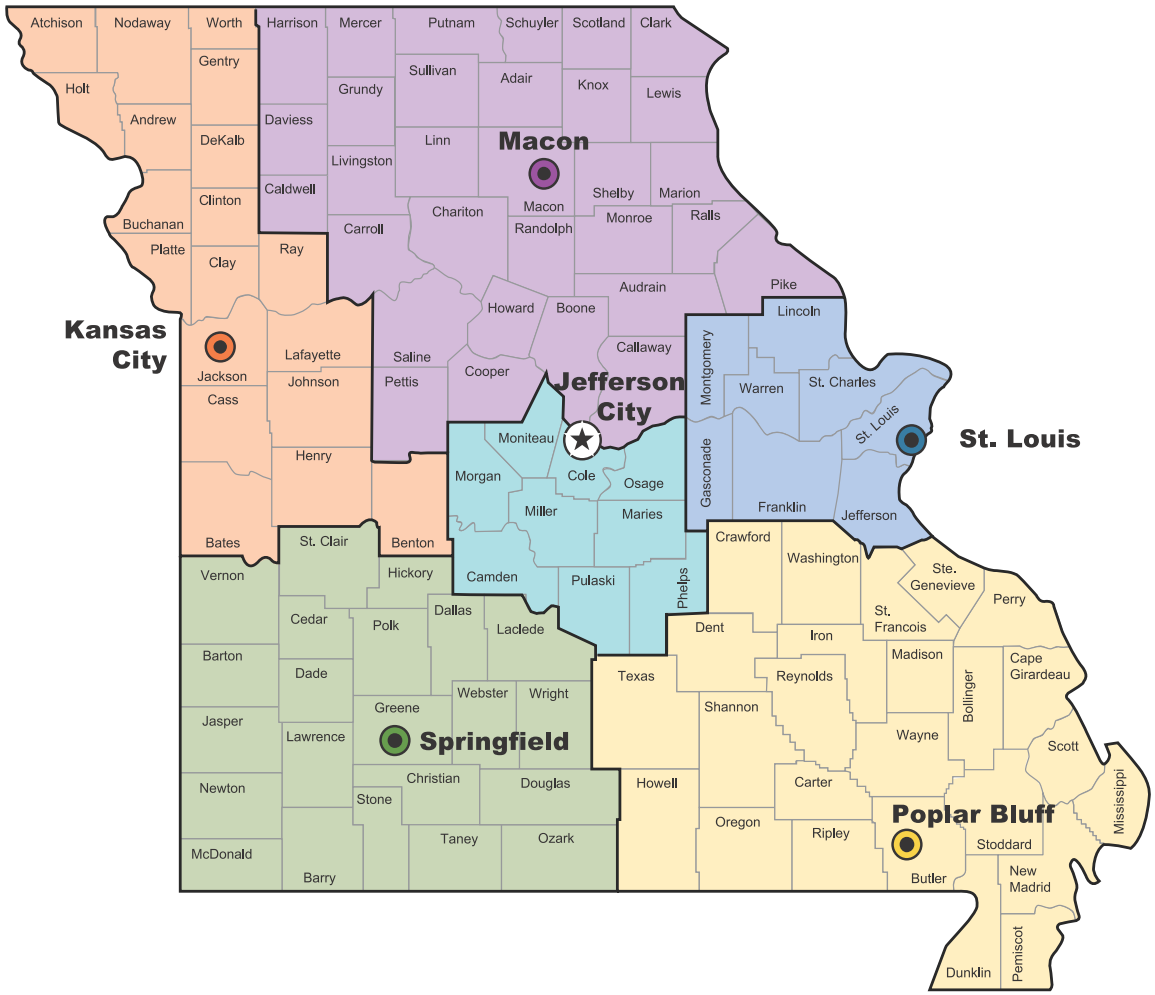
Southeast Area

Southeast Regional Office
2155 North Westwood Blvd.
Poplar Bluff, MO 63901
573-840-9750 FAX: 573-840-9754

Central Area

Department Central Offices
P.O. Box 176
Jefferson City, MO 65102-0176
573-751-3443

Central Field Operations
P.O. Box 176
Jefferson City, MO 65102-0176
573-522-3322 FAX: 573-522-3522



6/25/19

For more information on the departmer visit dnr.mo.gov or call 800-361-4827

APPENDIX D

DRAWINGS

(REFER TO CONSTRUCTION PLANS)

APPENDIX E

NOTICE OF TERMINATION (NOT) FORM H

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH
(SEE MAP FOR APPROPRIATE REGIONAL OFFICE)

FORM H – REQUEST FOR TERMINATION OF A GENERAL PERMIT

UNDER MISSOURI CLEAN WATER LAW

1.00 TYPE OF GENERAL PERMIT REQUESTED TO BE TERMINATED

1.10 PERMIT NUMBER

MO -

2.00 FACILITY

NAME		COUNTY	
ADDRESS	CITY	STATE	ZIP CODE

3.00 OWNER

NAME	E- MAIL	PHONE	
		FAX	
ADDRESS	CITY	STATE	ZIP CODE

4.00 CONTINUING AUTHORITY

NAME		PHONE	
		FAX	
ADDRESS	CITY	STATE	ZIP CODE

5.00 REASON FOR TERMINATION REQUEST: (CHECK ONE)

☐ For land disturbance sites, area is stabilized by seeding, mulching, sodding, paving, or other means, no further land disturbance activities are planned, all building construction (commercial or residential) is completed, and construction equipment removed.

☐ For industrial facilities, site activities have ceased and site closed and no significant materials remain exposed to storm water.

☐ For any type of site, a site specific permit was obtained.

☐ Other reason (specify) _____

6.00 I CERTIFY THAT I AM FAMILIAR WITH THE INFORMATION CONTAINED IN THE TERMINATION REQUEST, THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF SUCH INFORMATION IS TRUE, COMPLETE AND ACCURATE.

NAME AND OFFICIAL TITLE (TYPE OR PRINT)	TELEPHONE NO. (AREA CODE)
SIGNATURE	DATE SIGNED