



# PROJECT MANUAL

## *AASF & Cold Storage Hangar LED Lighting, POV and MVC Expansion*

*Whiteman Air Force Base*

*Knob Noster, Missouri*

Designed By: The Clark Enersen Partners  
2020 Baltimore Ave  
Suite 300  
Kansas City, MO 64108

Date Issued: May 27, 2022

Project No.: T2045-01

STATE *of* MISSOURI

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OFFICE *of* ADMINISTRATION

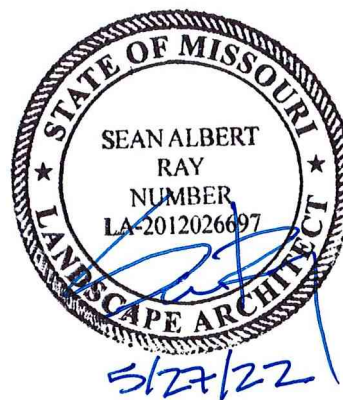
Facilities Management, Design & Construction

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**SECTION 00 01 07 - PROFESSIONAL SEALS AND CERTIFICATIONS**

**PROJECT NUMBER:** (T2045-01 "Whiteman Air Force Base – AASF & Cold Storage Hangar LED Lighting, POV and MVC Expansion")

**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:**



**LANDSCAPE ARCHITECT**



**ELECTRICAL ENGINEER**

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## SECTION 00 01 15 – LIST OF DRAWINGS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

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

### PART 2 - PRODUCTS (NOT APPLICABLE)

### PART 3 - EXECUTION

#### 3.1 LIST OF DRAWINGS

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

|     | <u>TITLE</u>   | <u>SHEET #</u> | <u>DATE</u> |
|-----|--|----------------|-------------|
| 1.  | Title Sheet  | Sheet G-000    | 05/27/22    |
| 2.  | General Notes, Symbols, Abbreviations<br>& Sheet Index       | Sheet G-001    | 05/27/22    |
| 3.  | Site Demolition Plan   | Sheet L-101    | 05/27/22    |
| 4.  | Site Layout Plan   | Sheet L-201    | 05/27/22    |
| 5.  | Erosion Control Plan   | Sheet L-300    | 05/27/22    |
| 6.  | Site Grading Plan  | Sheet L-301    | 05/27/22    |
| 7.  | Site Details   | Sheet L-401    | 05/27/22    |
| 8.  | Electrical Abbreviations, Symbols Legend,<br>& General Notes | Sheet E-000    | 05/27/22    |
| 9.  | Electrical Lighting Site Plan                                | Sheet E-001    | 05/27/22    |
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|     |                                 |             |          |
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| 21. | New Electrical One Line Diagram | Sheet E-302 | 05/27/22 |
| 22. | Electrical Details              | Sheet E-401 | 05/27/22 |
| 23. | Electrical Details              | Sheet E-402 | 05/27/22 |

**END OF SECTION 00 01 15**

## 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. AASF & Cold Storage Hangar LED Lighting, POV and MVC Expansion  
Whiteman Air Force Base  
Knob Noster, Missouri  
**Project No.: T2045-01**

### 3.0 BIDS WILL BE RECEIVED:

- A. Until: 1:30 PM, Tuesday, July 12, 2022
- B. **Only electronic bids on MissouriBUYS shall be accepted: <https://missouribuy.mo.gov>. Bidder must be registered to bid.**

### 4.0 DESCRIPTION:

- A. Scope: The Project consists of exterior LED lighting upgrades for the Army Aviation Support Facility (AASF) and interior and exterior LED lighting upgrades for the Cold Storage Hangar at Whiteman Air Force Base (WAFB). Additionally, upgraded exterior lighting, parking and site modifications for the Personal Owned Vehicle (POV) and Military Vehicle Compound (MVC) at the WAFB Readiness Center. It also includes changing the power supply for the Readiness Center to Whiteman Air Force Base's medium voltage electric grid, adding a generator tap box and a service entrance rated manual transfer switch.
- 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 AM, Thursday, June, 23, 2022, Missouri Army National Guard Readiness Center at One Attack Avenue, Knob Noster, MO 65305. PLEASE NOTE: All contractors/bidders without current access to Whiteman AFB are required to check in at the main gate visitor's center and meet with Bill Edwards 30 minutes prior to the start of the meeting. Mr. Edwards will escort bidders to the Pre-Bid Meeting location.
- 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 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 plan holder.**
- 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: Clark & Enersen, Rick Wise, phone # (816) 474-8237
- B. Project Manager: Eric Hibdon, PE phone # (573) 522.-0322

### 8.0 GENERAL INFORMATION:

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

- B. Bid results will be available at <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 contractor with applicable federal laws and regulations. The Bidder should review Section 007333, SUPPLEMENTARY GENERAL CONDITIONS FOR FEDERALLY FUNDED/ASSISTED CONSTRUCTION PROJECTS, which is made part of this solicitation 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://missouribuyss.mo.gov> and register. The bidder must register before access is granted to the solicitation details and bidding is possible, however, the bidder can review a summary of the project by selecting "Bid Board" and then checking off "Open" under "Status" and "OA-FMDC-Contracts Chapter 8" under "Organization" in the boxes shown on the left margin.
- B. Once registered, log in.
1. Under "Solicitation" select "View Current Solicitations." A new screen will open.
  2. Under "Filter by Agency" select "OA-FMDC-Contracts Chapter 8."
  3. Under "Filter by Opp. No." type in the State Project Number. Select "Submit."
  4. Above the dark blue bar, select "Other Active Opportunities."
  5. To see the Solicitation Summary, single click the Opp. No. (Project Number) and the summary will open. Single quick click each blue bar to open detailed information.
- C. Here are simplified instructions for uploading the bid to MissouriBUYS:
1. Find the solicitation by completing Steps 1 through 4 above.
  2. Select the three dots under "Actions." Select "Add New Response."
  3. When the Quote box opens, give the response a title and select "OK."
  4. The detailed solicitation will open. Select "Check All" for the Original Solicitation Documents, open each document, and select "Accept." If this step is not completed, a bid cannot be uploaded. Scroll to the bottom of the page and select "Add Attachments." If you do not see this command, not all documents have been opened and accepted.
  5. The Supplier Attachments box will open. Select "Add Attachment" again.
  6. The Upload Documents box will open. Read the instructions for uploading. Disregard the "Confidential" check box.
  7. Browse and attach up to 5 files at a time. Scroll to bottom of box and select "Upload." The Supplier Attachments box will open. Repeat Steps 5 through 7 if more than 5 files are to be uploaded.
  8. When the Supplier Attachments box opens again and uploading is complete, select "Done." A message should appear that the upload is successful. If it does not, go to the Bidder Response tab and select "Submit."
  9. The detailed solicitation will open. At the bottom select "Close."
- D. Any time a bidder wants to modify the bid, he or she will have to submit a new one. FMDC will open the last response the bidder submits. The bidder may revise and submit the bid up to the close of the solicitation (bid date and time). Be sure to allow for uploading time so that the bid is successfully uploaded prior to the 1:30 PM deadline; we can only accept the bid if it is uploaded before the deadline.
- E. If you want to verify that you are uploading documents correctly, we encourage you to submit a fake bid early. Label the fake bid as such to distinguish it from the real bid. The contracts person you contact will let you know if your "bid" was received successfully. Please contact Paul Girouard: 573-751-4797, [paul.girouard@oa.mo.gov](mailto:paul.girouard@oa.mo.gov) OR Mandy Roberson: 573-522-0074.
- F. If you are experiencing login issues, please contact Web Procure Support (Proactis) at 866-889-8533 anytime from 7:00 AM to 7:00 PM Central Time, Monday through Friday. If you try using a userid or password several times that is incorrect, the system will lock you out. Web Procure Support is the only option to unlock you! If you forget your userid or password, Web Procure Support will provide a temporary userid or password. Also, if it has been a while since your last successful login and you receive an "inactive" message, contact Web Procure (Proactis). If you are having a registration issue, you may contact Cathy Holliday at 573-751-3491 or by email: [cathy.holliday@oa.mo.gov](mailto:cathy.holliday@oa.mo.gov).

## IMPORTANT REMINDER REGARDING REQUIREMENT FOR OEO CERTIFICATION

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

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

## **SECTION 002113 – INSTRUCTIONS TO BIDDERS**

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

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

### **2.0 - BID DOCUMENTS**

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

### **3.0 - BIDDERS' OBLIGATIONS**

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

### **4.0 - INTERPRETATIONS**

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

## **5.0 - BIDS AND BIDDING PROCEDURE**

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

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

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

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

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

## **6.0 - SIGNING OF BIDS**

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

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

#### **7.0 - RECEIVING BID SUBMITTALS**

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

#### **8.0 - MODIFICATION AND WITHDRAWAL OF BIDS**

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

#### **9.0 - AWARD OF CONTRACT**

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



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

#### **10.0 - CONTRACT SECURITY**

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

#### **11.0 - LIST OF SUBCONTRACTORS**

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

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

#### **12.0 - WORKING DAYS**

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

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

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

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

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

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

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

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

B. MBE/WBE/SDVE General Requirements:

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

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

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

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

D. Certification of MBE/WBE/SDVE Subcontractors:

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

E. Waiver of MBE/WBE/SDVE Participation:

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

F. Contractor MBE/WBE/SDVE Obligations

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

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

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

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

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

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

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

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



# State of Missouri Construction Contract

THIS AGREEMENT, 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 Public Safety Missouri Army National Guard.

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:**

**AASF & Cold Storage Hangar LED Lighting, POV and MVC Expansion  
Whiteman Air Force Base  
Knob Noster, Missouri**

### **Project Number:**

**T2045-01**

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

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

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

## **ARTICLE 3. LIQUIDATED DAMAGES**

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

#### ARTICLE 4. CONTRACT SUM

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

|                  |    |
|------------------|----|
| Base Bid:        | \$ |
| Alternate No. 1: | \$ |
| Alternate No. 2: | \$ |
| Alternate No. 3: | \$ |

**TOTAL CONTRACT AMOUNT:** (\$CONTRACT AMOUNT)

#### ARTICLE 5. PREVAILING WAGE RATE

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

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

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

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

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

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

Total \$

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

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



## ARTICLE 7. CONTRACT DOCUMENTS

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

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

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

### APPROVED:

\_\_\_\_\_  
Mark Hill, P.E., Director  
Division of Facilities Management,  
Design and Construction

\_\_\_\_\_  
Contractor's Authorized Signature

DELETE IF PRIVATE OR PARTNERSHIP

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)

**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**

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**REASON FOR SUBSTITUTION**

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**DOES PROPOSED SUBSTITUTION AFFECT OTHER PARTS OF WORK?**☐ YES ☐ NO

IF YES, EXPLAIN

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**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:

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☐ Substitution is accepted.☐ Substitution is accepted with the following comments:

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☐ 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

**MBE/WBE/SDVE PROGRESS REPORT**

Remit with ALL Progress and Final Payments

(Please check appropriate box) ☐CONSULTANT ☐CONSTRUCTION

|   |                |
|---|----------------|
| PAY APP NO.   | PROJECT NUMBER |
| CHECK IF FINAL<br><input type="checkbox"/> <b>FINAL</b> | DATE           |

| PROJECT TITLE  |                                   |  |  |
|--|-----------------------------------|--|--|
| PROJECT LOCATION   |                                   |  |  |
| FIRM   |                                   |  |  |
| ORIGINAL CONTRACT SUM (Same as Line Item 1. on Form A of Application for Payment)<br>\$                      |                                   | TOTAL CONTRACT SUM TO DATE (Same as Line Item 3. on Form A of Application for Payment)<br>\$ |  |
| THE TOTAL MBE/WBE/SDVE PARTICIPATION DOLLAR AMOUNT OF THIS PROJECT AS INDICATED IN THE ORIGINAL CONTRACT: \$ |                                   |  |  |
| SELECT<br>MBE, WBE,<br>SDVE  | TOTAL<br>AMOUNT OF<br>SUBCONTRACT | \$ AMOUNT<br>PAID-TO-DATE<br>(include approved<br>contract changes)                          | CONSULTANT/SUBCONSULTANT OR<br>CONTRACTOR/SUBCONTRACTOR/SUPPLIER<br>COMPANY NAME |
| <input type="checkbox"/> MBE<br><input type="checkbox"/> WBE<br><input type="checkbox"/> SDVE                | \$                                | \$   |  |
| <input type="checkbox"/> MBE<br><input type="checkbox"/> WBE<br><input type="checkbox"/> SDVE                | \$                                | \$   |  |
| <input type="checkbox"/> MBE<br><input type="checkbox"/> WBE<br><input type="checkbox"/> SDVE                | \$                                | \$   |  |
| <input type="checkbox"/> MBE<br><input type="checkbox"/> WBE<br><input type="checkbox"/> SDVE                | \$                                | \$   |  |
| <input type="checkbox"/> MBE<br><input type="checkbox"/> WBE<br><input type="checkbox"/> SDVE                | \$                                | \$   |  |
| <input type="checkbox"/> MBE<br><input type="checkbox"/> WBE<br><input type="checkbox"/> SDVE                | \$                                | \$   |  |



## **INSTRUCTIONS FOR MBE/WBE/SDVE PROGRESS REPORT**

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

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

At Initial Pay Application fill in the following:

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

For all subsequent Pay Applications fill in the following:

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



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

PROJECT NUMBER

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

State of \_\_\_\_\_ personally came and appeared \_\_\_\_\_

(NAME)

of the \_\_\_\_\_

(POSITION)

(NAME OF THE COMPANY)

(a corporation) (a partnership) (a proprietorship) and after being duly sworn did depose and say that all provisions and requirements set out in Chapter 290, Sections 290.210 through and including 290.340, Missouri Revised Statutes, pertaining to the payment of wages to workmen employed on public works project have been fully satisfied and there has been no exception to the full and completed compliance with said provisions and requirements

and with Wage Determination No: \_\_\_\_\_ issued by the

Department of Labor and Industrial Relations, State of Missouri on the \_\_\_\_\_ day of \_\_\_\_\_ 20 \_\_\_\_

in carrying out the contract and working in connection with \_\_\_\_\_

(NAME OF PROJECT)

Located at \_\_\_\_\_ in \_\_\_\_\_ County

(NAME OF THE INSTITUTION)

Missouri, and completed on the \_\_\_\_\_ day of \_\_\_\_\_ 20 \_\_\_\_

SIGNATURE

**NOTARY INFORMATION**

NOTARY PUBLIC EMBOSSE OR  
BLACK INK RUBBER STAMP SEAL

STATE

COUNTY (OR CITY OF ST. LOUIS)

SUBSCRIBED AND SWORN BEFORE ME, THIS

DAY OF

YEAR

**USE RUBBER STAMP IN CLEAR AREA BELOW**

NOTARY PUBLIC SIGNATURE

MY COMMISSION  
EXPIRES

NOTARY PUBLIC NAME (TYPED OR PRINTED)

FILE: Closeout Documents

# GENERAL CONDITIONS

## INDEX

### ARTICLE:

#### 1. General Provisions

- 1.1. Definitions
- 1.2. Drawings and Specifications
- 1.3. Compliance with Laws, Permits, Regulations and Inspections
- 1.4. Nondiscrimination in Employment
- 1.5. Anti-Kickback
- 1.6. Patents and Royalties
- 1.7. Preference for American and Missouri Products and Services
- 1.8. Communications
- 1.9. Separate Contracts and Cooperation
- 1.10. Assignment of Contract
- 1.11. Indemnification
- 1.12. Disputes and Disagreements

#### 2. Owner/Designer Responsibilities

#### 3. Contractor Responsibilities

- 3.1. Acceptable Substitutions
- 3.2. Submittals
- 3.3. As-Built Drawings
- 3.4. Guaranty and Warranties
- 3.5. Operation and Maintenance Manuals
- 3.6. Other Contractor Responsibilities
- 3.7. Subcontracts

#### 4. Changes in the Work

- 4.1. Changes in the Work
- 4.2. Changes in Completion Time

#### 5. Construction and Completion

- 5.1. Construction Commencement
- 5.2. Project Construction
- 5.3. Project Completion
- 5.4. Payments

#### 6. Bond and Insurance

#### 6.1. Bond

#### 6.2. Insurance

#### 7. Termination or Suspension of Contract

#### 7.1. For Site Conditions

#### 7.2. For Cause

#### 7.3. For Convenience

## SECTION 007213 - GENERAL CONDITIONS

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

## ARTICLE 1 – GENERAL PROVISIONS

### ARTICLE 1.1 - DEFINITIONS

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

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

- 8. **"INCIDENTAL JOB BURDENS"**: Shall mean those expenses relating to the cost of work, incurred either in the home office or on the job-site, which are necessary in the course of doing business but are incidental to the job. Such costs include office supplies and equipment, postage, courier services, telephone expenses including long distance, water and ice and other similar expenses.
- 9. **"JOINT VENTURE"**: An association of two (2) or more businesses to carry out a single business enterprise for profit for which purpose they combine their property, capital, efforts, skills and knowledge.
- 10. **"OWNER"**: Whenever the term "Owner" is used, it shall mean the State of Missouri.
- 11. **"PROJECT"**: Wherever the term "Project" is used, it shall mean the work required to be completed by the construction contract.
- 12. **"PROJECT MANUAL"**: The "Project Manual" shall consist of Introductory Information, Invitation for Bid, Instructions to 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"**: Labor, material, supplies, plant and equipment required to perform and complete the service agreed to by the Contractor in a safe, expeditious, orderly and workmanlike manner so that the project shall be complete and finished in the best manner known to each respective trade.
- 15. **"WORKING DAYS"**: are all calendar days except Saturdays, Sundays and the following holidays: New Year's Day, Martin Luther King, Jr. Day, Lincoln Day, Washington's Birthday (observed), Truman Day, Memorial Day, Juneteenth, Independence Day, Labor Day, Columbus Day, Veterans Day (observed), Thanksgiving Day, Christmas Day.

### ARTICLE 1.2 DRAWINGS AND SPECIFICATIONS

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

architectural drawings shall govern and, in case of conflict between structural and mechanical drawings, structural drawings shall govern.

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

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

- A. Since the Owner is the State of Missouri, municipal or political subdivisions, zoning ordinances, construction codes (other than licensing of trades), and other like ordinances are not applicable to construction on Owner's property, and Contractor will not be required to submit drawings and specifications to any municipal or political subdivision, authority, obtain

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 plate 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 negotiated, and may vary according to the nature, extent, and complexity of the work involved. However, the overhead and profit for the Contractor or subcontractor actually performing the work shall not exceed 14%. When one or more tiers of subcontractors are used, in no event shall any Contractor or subcontractor receive as overhead and profit more than 3% of the cost of the work performed by any of his subcontractors. In no case shall the total overhead and profit paid by the Owner on any Contract Changes exceed twenty percent (20%) of the cost of materials, labor and equipment (exclusive of Contractor or any Subcontractor overhead and profit) necessary to put the contract change work in place.
  3. The Contractor will be allowed to add the cost of bonding and insurance to their cost of work. This bonding and insurance cost shall not exceed 2% and shall be allowed on the total cost of the added work, including overhead and profit.
  4. On proposals covering both increases and decreases in the amount of this contract, the application of overhead and profit shall be on the net change in the cost of the work.
  5. The percentage for overhead and profit to be credited to the Owner on Contract Changes that are solely decreases in the quantity of work or materials shall be negotiated, and may vary according to the nature, extent and complexity of the work involved, but in no case shall be less than ten percent (10%). If the percentage for overhead and profit charged for work added by Contract Changes for this contract has been negotiated to less than 10%, the negotiated rate shall then apply to credits as well.
- E. No claim for an addition to this contract sum shall be valid unless authorized as aforesaid in writing by the Owner. In the event that none of the foregoing methods are agreed upon, the Owner may order the Contractor to perform work on a time and material basis. The cost of such work shall be determined by the Contractor's actual labor and material cost to perform the work plus overhead and profit as outlined herein. The

Designer and Construction Representative shall approve the Contractor's daily time and material invoices for the work involved.

- F. If the Contractor claims that any instructions involve extra cost under this contract, the Contractor shall give the Owner's Representative written notice thereof within a reasonable time after the receipt of such instructions, and in any event before proceeding to execute the work. No such claim shall be valid unless so made and authorized by the Owner, in writing.
- G. In an emergency affecting the safety of life or of the structure or of adjoining property, the Contractor, without special instruction or authorization from the Construction Representative, is hereby permitted to act at their discretion to prevent such threatened loss or injury. The Contractor shall submit a claim for compensation for such emergency work in writing to the Owner's Representative.

#### **ARTICLE 4.2 – CHANGES IN COMPLETION TIME**

- A. Extension of the number of work days stipulated in the Contract for completion of the work with compensation may be made when:
  1. The contractor documents that proposed Changes in the work, as provided in Article 4.1, extends construction activities critical to contract completion date, OR
  2. The Owner suspends all work for convenience of the Owner as provided in Article 7.3, OR
  3. An Owner caused delay extends construction activities critical to contract completion (except as provided elsewhere in these General Conditions). The Contractor is to review the work activities yet to begin and evaluate the possibility of rescheduling the work to minimize the overall project delay.
- B. Extension of the number of work days stipulated in the Contract for completion of the work without compensation may be made when:
  1. Weather-related delays occur, subject to provisions for the inclusion of a specified number of "bad weather" days when provided for in Section 012100-Allowances, OR
  2. Labor strikes or acts of God occur, OR
  3. The work of the Contractor is delayed on account of conditions which were beyond the control of the Contractor, subcontractors or suppliers, and were not the result of their fault or negligence.
- C. No time extension or compensation will be provided for delays caused by or within the control

of the Contractor, subcontractors or suppliers and for concurrent delays caused by the Owner.

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

## **ARTICLE 5 - CONSTRUCTION AND COMPLETION**

### **ARTICLE 5.1 – CONSTRUCTION COMMENCEMENT**

- A. Upon receipt of the "Intent to Award" letter, the Contractor must submit the following properly executed instruments to the Owner:
1. Contract;
  2. Performance/payment bond as described in Article 6.1;
  3. Certificates of Insurance, or the actual policies themselves, showing that the Contractor has obtained the insurance coverage required by Article 6.2.
  4. Written Affirmative Action Plans as required in Article 1.4.

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

- B. Within the time frame noted in Section 013200 - Schedules, following receipt of the "Notice to Proceed", the Contractor shall submit to the Owner a progress schedule and schedule of values, showing activities through the end of the contract period. Should the Contractor not receive written notification from the Owner of the disapproval of the schedule of values within fifteen (15) working

days, the Contractor may consider it approved for purpose of determining when the first monthly Application and Certification for Payment may be submitted.

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

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

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

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

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

days notice before the inspection shall be performed.

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

and retainage. Within five (5) working days of the date of the Certificate of Substantial Completion, the Contractor shall identify the cost to complete any outstanding items of work. The Designer shall review the Contractor's estimate and either approve it or provide an independent estimate for all such items. If the Contractor fails to complete the remaining items within the time specified in the Certificate, the Owner may terminate the contract and go to the surety for project completion in accordance with Article 7.2 or release the contract balance to the Contractor less 150% of the approved estimate to complete the outstanding items. Upon completion of the outstanding items, when a final cost has been established, any monies remaining shall be paid to the Contractor. Failure to complete items of work does not relieve the Contractor from the obligation to complete the administrative requirements of the contract, such as the provisions of Article 5.3 FAILURE TO COMPLETE ALL ITEMS OF WORK UNDER THE CONTRACT SHALL BE CONSIDERED A DEFAULT AND BE GROUNDS FOR CONTRACT TERMINATION AND DEBARMENT.

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

#### **ARTICLE 5.4 -- PAYMENT TO CONTRACTOR**

- A. Payments on account of this contract will be made monthly in proportion to the work which has been completed. Request for payment must be submitted on the Owner's forms. No other pay request will



be processed. Supporting breakdowns must be in the same format as Owner's forms and must provide the same level of detail. The Designer will, within 5 working days from receipt of the contractor's request for payment either issue a Certificate for Payment to the Owner, for such amount as the Designer determines is properly due, or notify the Contractor in writing of reasons for withholding a Certificate. The Owner shall make payment within 30 calendar days after the "Application and Certification for Payment" has been received and certified by the Designer. The following items are to be attached to the contractor's pay request:

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

4. The payment request is accompanied by a breakdown identifying the material equipment, etc. in sufficient detail to establish quantity and value.
- E. The Contractor shall be allowed to include in the Application and Certification for Payment, one hundred (100%) of the value, subject to retainage, of major equipment and material stored off the site if all of the following conditions are met:
1. The request for consideration of payment for materials stored off site is made at least 15 working days prior to submittal of the Application for Payment including such material. Only materials inspected will be considered for inclusion on Application for Payment requests.
  2. Materials stored in one location off site are valued in excess of \$25,000.
  3. That a Certificate of Insurance is provided indicating adequate protection from loss, theft conversion or damage for materials stored off site. This Certificate shall show the State of Missouri as an additional insured for this loss.
  4. The materials are stored in a facility approved and inspected, by the Construction Representative.
  5. Contractor shall be responsible for, Owner costs to inspect out of state facilities, and any delays in the completion of the work caused by damage to the material or for any other failure of the Contractor to have access to this material for the execution of the work.
- F. The Owner shall determine the amount, quality and acceptability of the work and materials which are to be paid for under this contract. In the event any questions shall arise between the parties, relative to this contract or specifications, determination or decision of the Owner or the Construction Representative and the Designer shall be a condition precedent to the right of the Contractor to receive any money or payment for work under this contract affected in any manner or to any extent by such question.
- G. Payments Withheld: The Owner may withhold or nullify in whole or part any certificate to such extent as may be necessary to protect the Owner from loss on account of:
1. Defective work not remedied. When a notice of noncompliance is issued on an item or items, corrective action shall be undertaken immediately. Until corrective action is completed, no monies will be paid and no additional time will be allowed for the item or

items. The cost of corrective action(s) shall be borne by the Contractor.

2. A reasonable doubt that this contract can be completed for the unpaid balance.
3. Failure of the Contractor to update as-built drawings monthly for review by the Construction Representative.
4. Failure of the Contractor to update the construction schedule.

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

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

1. Where the specifications provide for the performance by the Contractor of (certain tests for the purpose of balancing and checking the air conditioning and heating equipment and the Contractor shall have furnished and installed all such equipment in accordance with the specifications, but said test cannot then be made because of climatic conditions, such test shall may be considered as required under the provisions of the specifications, Section 013300 and this contract may be substantial Full payment will not be made until the tests have been made and the equipment and system is finally accepted. If the tests are not completed when scheduled, the Owner may deduct 150% of the value of the tests from the final payment.
2. The final payment shall not become due until the Contractor delivers to the Construction Representative:
  - a) A complete file of releases, on the standard form included in the contract documents as "Final Receipt of Payment and Release Form", from subcontractors and material suppliers evidencing payment in full for services, equipment and materials, as the case may require, if the Owner approves, or a consent from

the Surety to final payment accepting liability for any unpaid amounts.

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

## **ARTICLE 6 -- INSURANCE AND BONDS**

### **ARTICLE 6.1 -- BOND**

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

## ARTICLE 6.2 – INSURANCE

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

### B. Minimum Scope and Extent of Coverage

#### 1. General Liability

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

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

#### 2. Automobile Liability

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

#### 3. Workers' Compensation and Employer's Liability

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

#### 4. Builder's Risk or Installation Floater Insurance

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

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

### C. Minimum Limits of Insurance

#### 1. General Liability

Contractor

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

\$2,000,000 annual aggregate

#### 2. Automobile Liability

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

#### 3. Workers' Compensation and Employers Liability

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

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

### D. Deductibles and Self-Insured Retentions

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

payment of losses and related investigations, claims administration, and defense expenses.

E. Other Insurance Provisions and Requirements

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

1. General Liability

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

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

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

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

2. Automobile Insurance

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

Contractor's insurance coverage shall be primary with respect to all additional insured's. Insurance or self-insurance

programs maintained by the designated additional insured's shall be in excess of the Contractor's insurance and shall not contribute with it.

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

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

3. Workers' Compensation/Employer's Liability

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

4. All Coverages

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

F. Insurer Qualifications and Acceptability

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

G. Verification of Insurance Coverage

Prior to Owner issuing a Notice to Proceed, the Contractor shall furnish the Owner with Certificate(s) of Insurance and with any applicable original endorsements evidencing the required insurance coverage. The insurance certificates and endorsements are to be signed by a person authorized by that insurer to bind coverage on its behalf. All certificates and endorsements received by the Owner are subject to review and approval by the Owner. The Owner reserves the right to require certified copies of all required policies at any time. If the scope of this contract will exceed one (1) year - or, if any of Contractor's applicable insurance coverage expires prior to completion of the work or services required under this contract -

the Contractor will provide a renewal or replacement certificate before continuing work or services hereunder. If the Contractor fails to provide documentation of required insurance coverage, the Owner may issue a stop work order and no additional contract completion time and/or compensation shall be granted as a result thereof.

## **ARTICLE 7 – SUSPENSION OR TERMINATION OF CONTRACT**

### **ARTICLE 7.1 - FOR SITE CONDITIONS**

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

### **ARTICLE 7.2 - FOR CAUSE**

#### **A. Termination or Suspension for Cause:**

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

calendar days after demand therefore, the Owner may take over the work and prosecute the same to completion by bid or negotiated contract, or the Owner may elect to take possession of and utilize in completing the work such materials, supplies, appliances and plant as may be on the site of the work, and all subcontractors, if the Owner elects, shall be bound to perform their contracts.

- B. The Contractor and its surety shall be and remain liable to the Owner for any excess cost or damages occasioned to the Owner as a result of the actions above set forth.
- C. The Contractor in the event of such suspension or termination shall not be entitled to receive any further payments under this contract until the work is wholly finished. Then if the unpaid balance under this contract shall exceed all expenses of the Owner as certified by the Director, such excess shall be paid to the Contractor; but, if such expenses shall exceed the unpaid balance as certified by the Director, the Contractor and their surety shall be liable for and shall pay the difference and any damages to the Owner.
- D. In exercising Owner's right to secure completion of the work under any of the provisions hereof, the Director shall have the right to exercise Owner's sole discretion as to the manner, methods and reasonableness of costs of completing the work.
- E. The rights of the Owner to suspend or terminate as herein provided shall be cumulative and not exclusive and shall be in addition to any other remedy provided by law.
- F. The Contractor in the event of such suspension or termination may be declared ineligible for Owner contracts for a minimal period of twelve (12) months. Further, no contract will be awarded to any Contractor who lists in their bid form any subcontractor whose prior performance has contributed, as determined by the Owner, to a breach of a contract. In order to be considered for state-awarded contracts after this period, the Contractor/subcontractor will be required to forward acceptance reports to the Owner regarding successful completion of non-state projects during the intervening twelve (12) months from the date of default. No contracts will be awarded to a subcontractor/Contractor until the ability to perform responsibly in the private sector has been proven to the Owner.

### **ARTICLE 7.3 -- FOR CONVENIENCE**

- A. The Owner may terminate or suspend the Contract or any portion of the Work without cause at any time, and at the Owner's convenience. Notification of a termination or suspension shall be in writing

and shall be given to the Contractor and their surety. If the Contract is suspended, the notice will contain the anticipated duration of the suspension or the conditions under which work will be permitted to resume. If appropriate, the Contractor will be requested to demobilize and re-mobilize and will be reimbursed time and costs associated with the suspension.

B. Upon receipt of notification, the Contractor shall:

1. Cease operations when directed.
2. Take actions to protect the work and any stored materials.
3. Place no further subcontracts or orders for material, supplies, services or facilities except as may be necessary to complete the portion of the Contract that has not been terminated. No claim for payment of materials or supplies ordered after the termination date shall be considered.
4. Terminate all existing subcontracts, rentals, material, and equipment orders.

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

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

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

## SECTION 007300 - SUPPLEMENTARY CONDITIONS

### 1.0 GENERAL:

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

### 2.0 CONTACTS:

Designer:

Rick Wise  
The Clark Enersen Partners  
2020 Baltimore Avenue  
Suite 300  
Kansas City, MO 64108  
Telephone: 816-474-8237  
Email: [Rick.Wise@clarkenersen.com](mailto:Rick.Wise@clarkenersen.com)

MONG Project Manager /  
Construction Representative:

Bill Edwards  
Missouri National Guard-CFMO Office  
6819a North Boundary Road  
Jefferson City, Missouri 65101  
Telephone: 573-638-9534 Fax: 573-638-9746  
Email: [billy.j.edwards66.nfg@mail.mil](mailto:billy.j.edwards66.nfg@mail.mil)

FMDC Project Manager:

Eric Hibdon  
State of Missouri, Office of Administration  
Division of Facilities Management, Design and Construction  
301 West High Street, Room 730  
Jefferson City, Missouri 65102  
Telephone: 573-522-0322  
Email: [Eric.Hibdon@oa.mo.gov](mailto:Eric.Hibdon@oa.mo.gov)

Contract Specialist:

Mandy Roberson  
Division of Facilities Management, Design and Construction  
301 West High Street, Room 730  
Jefferson City, Missouri 65102  
Telephone: 573-522-0074  
Email: [Mandy.Roberson@oa.mo.gov](mailto:Mandy.Roberson@oa.mo.gov)

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

### 4.0 FURNISHING CONSTRUCTION DOCUMENTS:

- A. The Owner will furnish the Contractor with approximately 3 complete sets of drawings and specifications at no charge.
- B. The Owner will furnish the Contractor with approximately 3 sets of explanatory or change drawings at no charge.
- C. The Contractor may make copies of the documents as needed with no additional cost to the Owner.

### 5.0 SAFETY REQUIREMENTS

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

### 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.



## **SECTION 007333 - SUPPLEMENTARY GENERAL CONDITIONS FOR FEDERALLY FUNDED/ASSISTED CONSTRUCTION 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:

| <b>Time-tables</b> | <b>Goals for minority participation for each trade</b> | <b>Goals for female participation in each trade</b> |
|--------------------|--|---|
| 105                | 12.7   | 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)**

##### **(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. pts. 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.

#### **11.0 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.

#### **12.0 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.

### **13.0 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.

#### **14.0 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.



## **15.0 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>.

## **16.0 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.

## **17.0 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.

## **18.0 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 (29 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.

## **19.0 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.

## **20.0 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. § 6201 et seq.).

## **21.0 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.

## **22.0 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.

## **23.0 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.

## **24.0 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.

## **25.0 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.

## **26.0 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.

## **27.0 Domestic Preference for Procurements**

As appropriate and to the extent consistent with law, the Contractor should, to the greatest extent practicable, 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). The requirements of this section must be included in all subawards including all contracts and purchase orders for work or products under this contract. For purposes of this section:

(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.

## **28.0 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.

Superseded General Decision Number: MO20210012

State: Missouri

Construction Type: Building

County: Johnson County in Missouri.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

|   |   |
|---|---|
| If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022: | . Executive Order 14026 generally applies to the contract.<br>. The contractor must pay all covered workers at least \$15.00 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2022.  |
| If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:         | . Executive Order 13658 generally applies to the contract.<br>. The contractor must pay all covered workers at least \$11.25 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2022. |

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <https://www.dol.gov/agencies/whd/government-contracts>.

| Modification Number | Publication Date |
|---------------------|------------------|
| 0                   | 01/07/2022       |
| 1                   | 02/18/2022       |
| 2                   | 02/25/2022       |
| 3                   | 04/01/2022       |

ASBE0027-004 10/01/2021

|   | Rates    | Fringes |
|---|----------|---------|
| ASBESTOS WORKER/HEAT & FROST INSULATOR..... | \$ 37.80 | 28.57   |

BRM00003-005 06/01/2020

|                  | Rates    | Fringes |
|------------------|----------|---------|
| TILE SETTER..... | \$ 36.79 | 15.78   |

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BRM00015-010 04/01/2020

|                 | Rates    | Fringes |
|-----------------|----------|---------|
| BRICKLAYER..... | \$ 36.83 | 19.87   |

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CARP0005-014 05/01/2021

|  | Rates    | Fringes |
|--|----------|---------|
| CARPENTER (Drywall Hanging,<br>Form Work & Metal Stud<br>Installation Only)..... | \$ 38.86 | 18.90   |

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ELEC0124-019 11/25/2019

|  | Rates    | Fringes |
|--|----------|---------|
| ELECTRICIAN (including low<br>voltage wiring for and<br>installation of alarms)..... | \$ 37.61 | 22.60   |

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ELEV0012-001 01/01/2022

|                        | Rates    | Fringes    |
|------------------------|----------|------------|
| ELEVATOR MECHANIC..... | \$ 53.45 | 36.885+a+b |

a. VACATION: Employer contributes 8% of basic hourly rate to vacation pay credit for employee who has worked in business more than 5 years and 6% for 6 months to 5 years as Vacation Pay Credit.

b. PAID HOLIDAYS: New Year's Day, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day, Friday after Thanksgiving Day and Christmas Day.

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ENGI0101-012 04/01/2020

|                           | Rates    | Fringes |
|---------------------------|----------|---------|
| POWER EQUIPMENT OPERATOR: |          |         |
| Bulldozer.....            | \$ 38.93 | 20.10   |
| Grader/Blade.....         | \$ 38.93 | 20.10   |
| Loader.....               | \$ 38.93 | 20.10   |
| Roller.....               | \$ 38.93 | 20.10   |

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IRON0010-030 04/01/2021

|  | Rates    | Fringes |
|--|----------|---------|
| IRONWORKER, REINFORCING AND<br>STRUCTURAL..... | \$ 34.50 | 31.99   |

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\* LAB00663-001 04/01/2022

|                         | Rates    | Fringes |
|-------------------------|----------|---------|
| LABORER                 |          |         |
| Brick Mason Tender..... | \$ 25.53 | 14.10   |
| Landscape.....          | \$ 24.03 | 14.10   |

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PAIN0003-018 04/01/2019

|                                       | Rates    | Fringes |
|---------------------------------------|----------|---------|
| PAINTER                               |          |         |
| Brush & Roller Only.....              | \$ 30.54 | 17.76   |
| Drywall Finishing/Taping<br>Only..... | \$ 31.74 | 17.76   |

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PLUM0008-001 06/01/2021

|  | Rates    | Fringes |
|--|----------|---------|
| PLUMBER, Excludes HVAC Pipe<br>Installation..... | \$ 49.43 | 23.29   |

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PLUM0533-008 06/01/2021

|   | Rates    | Fringes |
|---|----------|---------|
| PIPEFITTER, Includes HVAC<br>Pipe Installation..... | \$ 49.98 | 22.95   |

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ROOF0020-001 06/01/2021

|             | Rates    | Fringes |
|-------------|----------|---------|
| ROOFER..... | \$ 36.00 | 20.34   |

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SHEE0002-014 07/01/2021

|   | Rates    | Fringes |
|---|----------|---------|
| SHEET METAL WORKER, Includes<br>HVAC Duct and Unit<br>Installation..... | \$ 47.19 | 24.44   |

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SUM02010-011 03/08/2010

|  | Rates    | Fringes |
|--|----------|---------|
| CARPENTER, Excludes Drywall<br>Hanging, Form Work, and Metal<br>Stud Installation..... | \$ 23.33 | 7.42    |
| CEMENT MASON/CONCRETE FINISHER...  | \$ 17.95 | 6.64    |
| GLAZIER.....   | \$ 22.71 | 0.00    |
| LABORER: Common or General.....  | \$ 16.18 | 7.12    |
| OPERATOR: Backhoe/Trackhoe.....  | \$ 23.55 | 7.47    |
| OPERATOR: Paver (Asphalt,<br>Aggregate, and Concrete).....                             | \$ 24.47 | 0.00    |
| OPERATOR: Water Truck.....   | \$ 28.37 | 0.00    |
| PAINTER: Spray.....  | \$ 18.79 | 8.12    |
| TRUCK DRIVER: Dump Truck.....  | \$ 28.92 | 0.00    |

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WELDERS - Receive rate prescribed for craft performing  
operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

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The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

#### Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

#### Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

#### Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

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#### WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination



- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

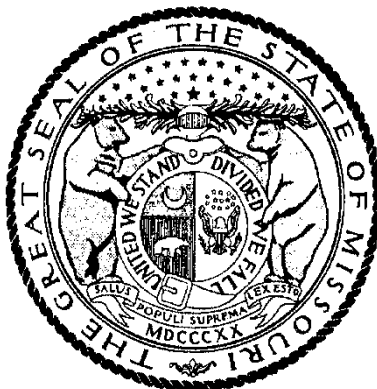
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END OF GENERAL DECISIO"

# Missouri

## Division of Labor Standards

### WAGE AND HOUR SECTION



MICHAEL L. PARSON, Governor

## Annual Wage Order No. 28

Section 051  
**JOHNSON COUNTY**

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

Original Signed by

Taylor Burks, Director  
Division of Labor Standards

Filed With Secretary of State: March 10, 2021

Last Date Objections May Be Filed: April 8, 2021

Prepared by Missouri Department of Labor and Industrial Relations

| OCCUPATIONAL TITLE           | **Prevailing<br>Hourly<br>Rate |
|------------------------------|--------------------------------|
| Asbestos Worker              | \$67.91                        |
| Boilermaker                  | *\$23.12                       |
| Bricklayer                   | \$58.31                        |
| Carpenter                    | \$56.45                        |
| Lather                       |                                |
| Linoleum Layer               |                                |
| Millwright                   |                                |
| Pile Driver                  |                                |
| Cement Mason                 | *\$23.12                       |
| Plasterer                    |                                |
| Communications Technician    | \$56.44                        |
| Electrician (Inside Wireman) | \$64.10                        |
| Electrician Outside Lineman  | *\$23.12                       |
| Lineman Operator             |                                |
| Lineman - Tree Trimmer       |                                |
| Groundman                    |                                |
| Groundman - Tree Trimmer     |                                |
| Elevator Constructor         | *\$23.12                       |
| Glazier                      | *\$23.12                       |
| Ironworker                   | \$64.83                        |
| Laborer                      | *\$23.12                       |
| General Laborer              |                                |
| First Semi-Skilled           |                                |
| Second Semi-Skilled          |                                |
| Mason                        | *\$23.12                       |
| Marble Mason                 |                                |
| Marble Finisher              |                                |
| Terrazzo Worker              |                                |
| Terrazzo Finisher            |                                |
| Tile Setter                  |                                |
| Tile Finisher                |                                |
| Operating Engineer           | *\$23.12                       |
| Group I                      |                                |
| Group II                     |                                |
| Group III                    |                                |
| Group III-A                  |                                |
| Group IV                     |                                |
| Group V                      |                                |
| Painter                      | \$50.01                        |
| Plumber                      | \$71.61                        |
| Pipe Fitter                  |                                |
| Roofer                       | \$56.90                        |
| Sheet Metal Worker           | \$70.15                        |
| Sprinkler Fitter             | *\$23.12                       |
| Truck Driver                 | *\$23.12                       |
| Truck Control Service Driver |                                |
| Group I                      |                                |
| Group II                     |                                |
| Group III                    |                                |
| Group IV                     |                                |

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

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

Heavy Construction Rates for  
JOHNSON County

Section 051

| OCCUPATIONAL TITLE            | **Prevailing<br>Hourly<br>Rate |
|-------------------------------|--------------------------------|
| Carpenter                     | *\$23.12                       |
| Millwright                    |                                |
| Pile Driver                   |                                |
| Electrician (Outside Lineman) | *\$23.12                       |
| Lineman Operator              |                                |
| Lineman - Tree Trimmer        |                                |
| Groundman                     |                                |
| Groundman - Tree Trimmer      |                                |
| Laborer                       | \$43.84                        |
| General Laborer               |                                |
| Skilled Laborer               |                                |
| Operating Engineer            | \$54.60                        |
| Group I                       |                                |
| Group II                      |                                |
| Group III                     |                                |
| Group IV                      |                                |
| Truck Driver                  | *\$23.12                       |
| Truck Control Service Driver  |                                |
| Group I                       |                                |
| Group II                      |                                |
| Group III                     |                                |
| Group IV                      |                                |

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

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

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

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

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

# OVERTIME and HOLIDAYS

## OVERTIME

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

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

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

## HOLIDAYS

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

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

## **SECTION 01 10 00 – 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 exterior LED lighting upgrades for the Army Aviation Support Facility (AASF) and interior and exterior LED lighting upgrades for the Cold Storage Hanger at Whiteman Air Force Base (WAFB). Additionally, upgraded exterior lighting, parking and site modifications for the Personal Owned Vehicle (POV) and Military Vehicle Compound (MVC) at the WAFB Readiness Center. Scope also includes changing the power supply for the Readiness Center to Whiteman Air Force Base's medium voltage electric grid, adding a generator tap box and a service entrance rated manual transfer switch.
  - 1. Project Location: One Attack Avenue, Knob Noster, MO 65305
  - 2. Owner: State of Missouri, Office of Administration, Division of Facilities Management, Design and Construction, Harry S Truman State Office Building, Post Office Box 809, 301 West High Street, Jefferson City, Missouri 65102.
- B. Contract Documents, dated May 27, 2022 were prepared for the Project by Clark & Enersen.
- C. The Work will be constructed under a single prime contract.

#### **1.3 WORK SEQUENCE**

- A. The Work will be conducted in one phase. Work of this phase shall be substantially complete, ready for occupancy within 120 Working Days from issuance of Notice of Intent to Award. Coordinate with owner as to any required sequencing of construction activities required to accommodate needs of users occupying buildings during construction.

#### **1.4 CONTRACTOR USE OF PREMISES**

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

- C. Use of the Existing Building: Maintain the existing building in good condition throughout the construction period. Repair damage cause by construction operations. Take all precautions necessary to protect the building and its occupants during the construction period.

## **1.5 OCCUPANCY REQUIREMENTS**

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

## **1.6 MISCELLANEOUS PROVISIONS**

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

### **PART 3 - EXECUTION (Not Applicable)**

**END OF SECTION 01 10 00**

## **SECTION 01 21 00 – ALLOWANCES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

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

#### **1.3 WEATHER ALLOWANCE**

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



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

**PART 3 - EXECUTION**

**3.1 SCHEDULE OF ALLOWANCES**

- A. Weather Allowance: Included within the completion period for this Project 10 "bad weather" days.

**END OF SECTION 01 21 00**

## **SECTION 01 23 00 - ALTERNATES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

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

#### **1.3 DEFINITIONS**

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

#### **1.4 PROCEDURES**

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

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

### **PART 3 - EXECUTION**

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

- A. Alternate No. 1: *New south MVC parking lot, to include lighting and fencing in expansion, per drawings.*
- B. Alternate No. 2: *Expand POV parking lot, to include lighting in expansion, per drawings.*

- C. Alternate No. 3: *Installation of new Manual Transfer Switch and Docking Station as shown on the Electrical Sheets.*

**END OF SECTION 01 23 00**

## **SECTION 01 26 00 – 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. Section 01 21 00 "Allowances" for procedural requirements for handling and processing Allowances.
  - 2. Section 01 31 15 "Project Management Communications" for administrative requirements for communications.
  - 3. Section 00 72 13, Article 3.1 "Acceptable Substitutions" for administrative procedures for handling Requests for Substitutions made after Contract award.
  - 4. Section 00 72 13, Article 4.0 "Changes in the Work" for Change Order requirements.

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

- A. In the event that the Contractor or Subcontractor, at any tier, determines that some portion of the Drawings, Specifications, or other Contract Documents requires clarification or interpretation, the Contractor shall submit a "Request for Information" (RFI) in writing to the Designer. A RFI may only be submitted by the Contractor and shall only be submitted on the RFI forms provided by the Owner. The Contractor shall clearly and concisely set forth the issue for which clarification or interpretation is sought and why a response is needed. In the RFI, the Contractor shall set forth an interpretation or understanding of the requirement along with reasons why such an understanding was reached.
- B. Responses to RFI shall be issued within ten (10) working days of receipt of the Request from the Contractor unless the Designer determines that a longer time is necessary to provide an adequate response. If a longer time is determined necessary by the Designer, the Designer will, within five (5) working days of receipt of the request, notify the Contractor of the anticipated response time. If the Contractor submits a RFI on a time sensitive activity on the current project schedule, the Contractor shall not be entitled to any time extension due to the time it takes the Designer to respond to the request provided that the Designer responds within the ten (10) working days set forth above.
- C. Responses from the Designer will not change any requirement of the Contract Documents. In the event the Contractor believes that a response to a RFI will cause a change to the requirements of the Contract Document, the Contractor shall give written notice to the Designer requesting a Change Order for the work. Failure to give such written notice within ten (10) working days, shall waive the Contractor's right to seek additional time or cost under Article 4, "Changes in the Work" of the General Conditions.

#### **1.4 MINOR CHANGES IN THE WORK**

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

#### **1.5 PROPOSAL REQUESTS**

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

#### **1.6 CHANGE ORDER PROCEDURES**

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

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

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

**END OF SECTION 01 26 00**

## **SECTION 01 31 00 – 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. Section 01 32 00 "Schedules" for preparing and submitting Contractor's Construction Schedule.
  - 2. Articles 1.8.B and 1.8.C of Section 007213 "General Conditions" for coordinating meetings onsite.
  - 3. Article 5.4.H of Section 007213 "General Conditions" for coordinating Closeout of the Contract.

#### **1.3 COORDINATION**

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

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

#### **1.4 SUBMITTALS**

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

#### **1.5 PROJECT MEETINGS**

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

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



4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
6. Revise paragraph below if Project requires holding progress meetings at different intervals. Insert special intervals such as "every third Tuesday" to suit special circumstances.
7. Project name
8. Name and address of Contractor
9. Name and address of Designer
10. RFI number including RFIs that were dropped and not submitted
11. RFI description
12. Date the RFI was submitted
13. Date Designer's response was received
14. Identification of related DSI or Proposal Request, as appropriate

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

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

**END OF SECTION 01 31 00**

## SECTION 01 31 15 - 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. Section 01 33 00 - Submittals
- C. Section 01 26 00 – 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](mailto:OA.FMDCE-BuilderSupport@oa.mo.gov).
  - 2. Authorized users will be contacted directly and assigned a temporary user password.
  - 3. Individuals shall be responsible for the proper use of their passwords and access to data as agents of the company in which they are employed.
- F. Administrative Users: Administrative users have access and control of user licenses and all posted items. DO NOT POST PRIVATE OR YOUR COMPANY CONFIDENTIAL ITEMS IN THE DATABASE! Improper or abusive language toward any party or repeated posting of items intended to deceive or disrupt the work of the project will not be tolerated and will result in

deletion of the offensive items and revocation of user license at the sole discretion of the Administrative User(s).

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

1. Document Integrity and Revisions:
  - a. Documents, comments, drawings and other records posted to the system shall remain for the project record. The authorship time and date shall be recorded for each document submitted to the system. Submitting a new document or record with a unique ID, authorship, and time stamp shall be the method used to make modifications or corrections.
  - b. The system shall make it easy to identify revised or superseded documents and their predecessors.
  - c. Server or Client side software enhancements during the life of the project shall not alter or restrict the content of data published by the system. System upgrades shall not affect access to older documents or software.
2. Document Security:
  - a. The system shall provide a method for communication of documents. Documents shall allow security group assignment to respect the contractual parties communication except for Administrative Users. **DO NOT POST PRIVATE OR YOUR COMPANY CONFIDENTIAL ITEMS IN THE DATABASE!**
3. Document Integration:
  - a. Documents of various types shall be logically related to one another and discoverable. For example, requests for information, daily field reports, supplemental sketches and photographs shall be capable of reference as related records.
4. Reporting:
  - a. The system shall be capable of generating reports for work in progress, and logs for each document type. Summary reports generated by the system shall be available for team members.
5. Notifications and Distribution:
  - a. Document distribution to project members shall be accomplished both within the extranet system and via email as appropriate. Project document distribution to parties outside of the project communication system shall be accomplished by secure email of outgoing documents and attachments, readable by a standard email client.
6. Required Document Types:
  - a. RFI, Request for Information.
  - b. Submittals, including record numbering by drawing and specification section.
  - c. Transmittals, including record of documents and materials delivered in hard copy.
  - d. Meeting Minutes.
  - e. Application for Payments (Draft or Pencil).
  - f. Review Comments.
  - g. Field Reports.
  - h. Construction Photographs.
  - i. Drawings.
  - j. Supplemental Sketches.
  - k. Schedules.
  - l. Specifications.
  - m. Request for Proposals
  - n. Designer's Supplemental Instructions
  - o. Punch Lists

- H. Record Keeping: Except for paper documents, which require original signatures and large format documents (greater than 8½ x 11 inches), all other 8½ x 11 inches documents shall be submitted by transmission in electronic form to the E-Builder® web site by licensed users.
- a. The Owner and his representatives, the Designer and his consultants, and the Contractor and his Sub Contractors and suppliers at every tier shall respond to documents received in electronic form on the web site, and consider them as if received in paper document form.
  - b. The Owner and his representatives, the Designer and his consultants, and the Contractor and his Sub Contractors and suppliers at every tier reserves the right to and shall reply or respond by transmissions in electronic form on the web site to documents actually received in paper document form.
  - c. The Owner and his representatives, the Designer and his consultants, and the Contractor and his Sub Contractors and suppliers at every tier reserves the right to and shall copy any paper document into electronic form and make same available on the web site.
- I. Minimum Equipment and Internet Connection: In addition to other requirements specified in this Section, the Owner and his representatives, the Construction Manager and his representatives, the Architect and his consultants, and the Contractor and his sub-contractors and suppliers at every tier required to have a user license(s) shall be responsible for the following:
1. Providing suitable computer systems for each licensed user at the users normal work location<sup>1</sup> 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<sup>2</sup> and software requirements:
    - a. Desktop configuration (Laptop configurations are similar and should be equal to or exceed desktop system.)
      - 1) Operating System: Windows XP or newer
      - 2) Internet Browser: Internet Explorer 6.01SP2+ (Recommend IE7.0+)
      - 3) Minimum Recommend Connection Speed: 256K or above
      - 4) Processor Speed: 1 Gigahertz and above
      - 5) RAM: 512 mb
      - 6) Operating system and software shall be properly licensed.
      - 7) Internet Explorer version 7 (current version is a free distribution for download). This specification is not intended to restrict the host server or client computers provided that industry standard HTTP clients may access the published content.
      - 8) Adobe Acrobat Reader (current version is a free distribution for download).
      - 9) Users should have the standard Microsoft Office Suite (current version must be purchased) or the equivalent.

## PART 2 - PRODUCTS (Not Applicable)

## PART 3 - EXECUTION (Not Applicable.)

## END OF SECTION 01 31 15

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

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

## **SECTION 01 32 00 – SCHEDULE – BAR CHART**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

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

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

### **PART 3 - EXECUTION**

#### **3.1 SUBMITTAL PROCEDURES**

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

### 3.2 CONSTRUCTION PROGRESS SCHEDULE – BAR CHART SCHEDULE

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

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

### **3.3 SCHEDULE OF SUBMITTALS**

- A. Upon acceptance of the Construction Progress Schedule, prepare and submit a complete schedule of submittals. Coordinate the submittal schedule with Section 013300 SUBMITTALS, the approved Construction Progress Schedule, list of subcontracts, Schedule of Values and the list of products.
- B. Prepare the schedule in chronological order. Provide the following information
1. Scheduled date for the first submittal
  2. Related Section number
  3. Submittal category
  4. Name of the Subcontractor
  5. Description of the part of the Work covered
  6. Scheduled date for resubmittal
  7. Scheduled date for the Designer's final release or approval

- C. Distribution: Following the Designer's response to the initial submittal schedule, print and distribute copies to the Designer, Owner, subcontractors, and other parties required to comply with submittal dates indicated.
  - 1. Post copies in the Project meeting room and temporary field office.
  - 2. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned part of the Work and are no longer involved in construction activities.
- D. Schedule Updating: Revise the schedule after each meeting or other activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

### **3.4 SCHEDULE OF INSPECTIONS AND TESTS**

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

**END OF SECTION 01 32 00**



## **SECTION 01 33 00 – 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. Section 01 31 15 "Project Management Communications" for administrative requirements for communications.

#### **1.2 SUMMARY**

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

### **1.3 SUBMITTAL PROCEDURES**

- A. The Contractor shall comply with the General and Supplementary Conditions and other applicable sections of the Contract Documents. The Contractor shall submit, with such promptness as to cause no delay in his work or in that of any other contractors, all required submittals indicated in Part 3.1 of this section and elsewhere in the Contract Documents. Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
  - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  - 2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
    - a. The Designer reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.
- B. Each drawing and/or series of drawings submitted must be accompanied by a letter of transmittal giving a list of the titles and numbers of the drawings. Each series shall be numbered consecutively for ready reference and each drawing shall be marked with the following information:
  - 1. Date of Submission
  - 2. Name of Project
  - 3. Location
  - 4. Section Number of Specification
  - 5. State Project Number
  - 6. Name of Submitting Contractor
  - 7. Name of Subcontractor
  - 8. Indicate if Item is submitted as specified or as a substitution

### **1.4 SHOP DRAWINGS**

- A. Comply with the General Conditions, Article 3.2.
- B. The Contractor shall submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.
- C. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates, and similar drawings including the following information:
  - 1. Dimensions
  - 2. Identification of products and materials included by sheet and detail number
  - 3. Compliance with specified standards
  - 4. Notation of coordination requirements
  - 5. Notation of dimensions established by field measurement

6. Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8½"x11" but no larger than 36"x48".

## **1.5 PRODUCT DATA**

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

## **1.6 SAMPLES**

- A. The Contractor shall comply with the General Conditions, Article 3.2.
- B. The Contractor shall submit full-size, fully fabricated samples, cured and finished as specified, and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern.
  1. The Contractor shall mount or display samples in the manner to facilitate review of qualities indicated. Prepare samples to match the Designer's sample including the following:
    - a. Specification Section number and reference
    - b. Generic description of the Sample
    - c. Sample source
    - d. Product name or name of the Manufacturer
    - e. Compliance with recognized standards
    - f. Availability and delivery time
  2. The Contractor shall submit samples for review of size, kind, color, pattern, and texture. Submit samples for a final check of these characteristics with other elements and a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
    - a. Where variation in color, pattern, texture, or other characteristic is inherent in the material or product represented, submit at least three (3) multiple units that show approximate limits of the variations.

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

## **1.7 QUALITY ASSURANCE DOCUMENTS**

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

## **1.8 OPERATING AND MAINTENANCE MANUALS AND WARRANTIES**

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

## PART 2 - PRODUCTS (Not Applicable)

## PART 3 - EXECUTION

### 3.1 REQUIRED SUBMITTALS

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

| SPEC SECTION | TITLE   | CATEGORY                       |
|--------------|---|--------------------------------|
| 01 32 00     | Schedules                                     | Construction Schedule          |
| 01 32 00     | Schedules                                     | Schedule of Values             |
| 01 32 00     | Schedules                                     | List of Subcontractors         |
| 01 32 00     | Schedules                                     | Major Material Suppliers       |
| 03 30 00     | Cast-In-Place Concrete                        | Shop Drawings                  |
| 03 30 00     | Cast-In-Place Concrete                        | Test Report                    |
| 03 30 00     | Cast-In-Place Concrete                        | Product Data                   |
| 26 05 00     | Electrical General Provisions                 | Shop Drawings                  |
| 26 05 00     | Electrical General Provisions                 | Test Report                    |
| 26 05 00     | Electrical General Provisions                 | Operation / Maintenance Manual |
| 26 05 01     | Basic Materials and Methods                   | Shop Drawings                  |
| 26 05 01     | Basic Materials and Methods                   | Product Data                   |
| 26 05 01     | Basic Materials and Methods                   | Operation / Maintenance Manual |
| 26 05 13     | Medium Voltage Cables                         | Product Data                   |
| 26 05 19     | Conductors                                    | Product Data                   |
| 26 05 26     | Grounding System                              | Product Data                   |
| 26 05 26     | Grounding System                              | Shop Drawings                  |
| 26 05 33     | Raceways                                      | Product Data                   |
| 26 05 13     | Service Entrance Rated Manual Transfer Switch | Shop Drawings                  |
| 26 05 13     | Service Entrance Rated Manual Transfer Switch | Product Data                   |
| 26 05 13     | Service Entrance Rated Manual Transfer Switch | Operation / Maintenance Manual |
| 26 05 13     | Service Entrance Rated Manual Transfer Switch | Test Report                    |
| 26 05 13     | Service Entrance Rated Manual Transfer Switch | Warranty                       |
| 26 51 00     | Lighting                                      | Shop Drawings                  |
| 26 51 00     | Lighting                                      | Product Data                   |
| 31 20 00     | Earth Moving                                  | Product Data                   |
| 31 20 00     | Earth Moving                                  | Test Report                    |
| 32 12 16     | Asphalt Paving                                | Product Data                   |
| 32 13 13     | Concrete Paving                               | Shop Drawings                  |
| 32 15 40     | Crushed Stone Surfacing                       | Test Report                    |
| 32 92 00     | Turf and Grasses                              | Product Data                   |
| 32 92 00     | Turf and Grasses                              | Certification                  |
| 32 92 00     | Turf and Grasses                              | Test Report                    |
| 32 92 00     | Turf and Grasses                              | Operation / Maintenance Manual |
| 33 46 00     | Subdrainage Systems                           | Product Data                   |
| 33 73 13     | Liquid Filled Utility Transformers            | Shop Drawings                  |
| 33 73 13     | Liquid Filled Utility Transformers            | Product Data                   |
| 33 73 13     | Liquid Filled Utility Transformers            | Test Report                    |

**END OF SECTION 01 33 00**

## **SECTION 01 35 13.28 – SITE SECURITY AND HEALTH REQUIREMENTS (MONG)**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUBMITTALS**

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

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

### **PART 3 - EXECUTION**

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

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

#### **3.2 FIRE PROTECTION, SAFETY, AND HEALTH CONTROLS**

- A. The Contractor shall take all necessary precautions to guard against and eliminate possible fire hazards.
  - 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](mailto: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](mailto: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](mailto: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.

### **END OF SECTION 01 35 13.28**



## **SECTION 01 50 00 – CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

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

#### **1.3 SUBMITTALS**

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

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

## **1.4 QUALITY ASSURANCE**

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

## **1.5 PROJECT CONDITIONS**

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

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. General: Provide new materials. If acceptable to the Designer, the Contractor may use undamaged, previously used materials in serviceable condition. Provide materials suitable for use intended.
- B. Lumber and Plywood: Comply with requirements in Division 6 Section "Rough Carpentry".
  - 1. For job-built temporary office, shops, and sheds within the construction area, provide UL-labeled, fire-treated lumber and plywood for framing, sheathing, and siding.
  - 2. For signs and directory boards, provide exterior-type, Grade B-B high-density concrete form overlay plywood of sized and thicknesses indicated.

3. For fences and vision barriers, provide minimum 3/9" (9.5mm) thick exterior plywood.
  4. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8" (16mm) thick exterior plywood.
- C. 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.
  - D. Water: Provide potable water approved by local health authorities.
  - E. Open-Mesh Fencing: Provide 0.120" (3mm) thick, galvanized 2" (50mm) chainlink fabric fencing 6' (2m) high with galvanized steel pipe posts, 1½" (38mm) ID for line posts and 2½" (64mm) ID for corner posts.

## 2.2 EQUIPMENT

- A. General: Provide new equipment. If acceptable to the Designer, the Contractor may use undamaged, previously used equipment in serviceable condition. Provide equipment suitable for use intended.
- B. Water Hoses: Provide ¾" (19mm), heavy-duty, abrasion-resistant, flexible rubber hoses 100' (30m) long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.
- C. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110 to 120V plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.
- D. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage rating.
- E. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered-glass enclosures where exposed to breakage. Provide exterior fixture where exposed to moisture.
- F. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM, or another recognized trade association related to the type of fuel being consumed.
- G. Temporary Offices: Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows, and serviceable finishes. Provide heated and air-conditioned units on foundations adequate for normal loading.
- H. Temporary Toilet Units: Provide self-contained, single-occupant toilet units of the chemical, aerated re-circulation, or combustion type. Provide units properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
- I. Fire Extinguishers: Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers, or a combination of extinguishers of NFPA-recommended classes for the exposures.

1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

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

### **3.2 TEMPORARY UTILITY INSTALLATION**

- A. General: Engage the appropriate local utility company to install temporary service or connect to existing service. Where company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with company recommendations.
  1. Arrange with company and existing users for a time when service can be interrupted, if necessary, to make connections for temporary services.
  2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.
  3. Obtain easements to bring temporary utilities to the site where the Owner's easements cannot be used for that purpose.
  4. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Designer. Neither the Owner nor Designer will accept cost or use charges as a basis of claims for Change Order.
- B. Temporary Water Service: The Owner will provide water for construction purposes from the existing building system. All required temporary extensions shall be provided and removed by the Contractor. Connection points and methods of connection shall be designated and approved by the Construction Representative.
- C. Temporary Electric Power Service: 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 Lighting: When overhead floor or roof deck has been installed, provide temporary lighting with local switching.
  1. Install and operate temporary lighting that will fulfill security and protection requirements without operating the entire system. Provide temporary lighting that will provide adequate illumination for construction operations and traffic conditions.
- E. Temporary Heating and Cooling: The normal heating and/or cooling system of the building shall be maintained in operation during the construction. Should the Contractor find it necessary to interrupt the normal HVAC service to spaces, which have not been vacated for construction, such interruptions shall be pre-scheduled with the Construction Representative.

- F. 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.
- G. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a health and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.
  - 1. Provide paper towels or similar disposable materials for each facility.
  - 2. Provide covered waste containers for used material.
  - 3. Provide safety showers, eyewash fountains, and similar facilities for convenience, safety, and sanitation of personnel.
- H. Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rains.

### **3.3 SUPPORT FACILITIES INSTALLATION**

- A. General: Locate field offices, storage sheds, and other temporary construction and support facilities for easy access.
  - 1. Maintain support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.
- B. Field Offices: Provide insulated, weathertight temporary offices of sufficient size to accommodate required office personnel at the Project site. Keep the office clean and orderly for use for small progress meetings. Furnish and equip office as follows:
  - 1. Furnish with a desk and chairs, a 4-drawer file cabinet, plan table, plan rack, and a 6-shelf bookcase.
  - 2. Equip with a water cooler and private toilet complete with water closet, lavatory, and medicine cabinet unit with a mirror.
- C. Storage Facilities: The Owner will provide storage onsite as designated by the Facility Representative or the Construction Representative. Areas for use by the Contractor for storage will be identified at the Pre-Bid Meeting.
- D. Temporary Paving: Construct and maintain temporary roads and paving to support the indicated loading adequately and to withstand exposure to traffic during the construction period. Locate temporary paving for roads, storage areas, and parking where the same permanent facilities will be located. Review proposed modifications to permanent paving with the Designer.
  - 1. Coordinate temporary paving development with subgrade grading, compaction, installation and stabilization of subbase, and installation of base and finish courses of permanent paving.

2. Install temporary paving to minimize the need to rework the installations and to result in permanent roads and paved areas without damage or deterioration when occupied by the Owner.
  3. Delay installation of the final course of permanent asphalt concrete paving until immediately before Substantial Completion. Coordinate with weather conditions to avoid unsatisfactory results.
  4. Extend temporary paving in and around the construction area as necessary to accommodate delivery and storage of materials, equipment usage, administration, and supervision.
- E. Construction Parking: Parking at the site will be provided in the areas designated at the Pre-Construction Meeting.
- F. Construction Parking: Contractors must be prepared to discuss their storage and parking needs at the Pre-Bid Meeting. Parking for construction personnel cannot be provided onsite. All parking will be offsite. The Contractor will have to park on the street, in city-owned lots, or in commercial lots. Under no circumstances will any vehicle be parked in a fire lane. Parking on lawns shall be prohibited.
- G. Dewatering Facilities and Drains: For temporary drainage and dewatering facilities and operations not directly associated with construction activities included under individual Sections, comply with dewatering requirements of applicable Division 2 Sections. Where feasible, utilize the same facilities. Maintain the site, excavations, and construction free of water.
- H. Temporary Lifts and Hoists: Provide facilities for hoisting materials and employees. Truck cranes and similar devices used for hoisting materials are considered “tools and equipment” and not temporary facilities.
- I. Project Identification and Temporary Signs: Prepare project identification and other signs of size indicated. Install signs where indicated to inform the public and persons seeking entrance to the Project. Support on posts or framing of preservative-treated wood or steel. Do not permit installation of unauthorized signs.
1. Project Identification Signs: Engage an experienced sign painter to apply graphics. Comply with details indicated.
  2. Temporary Signs: Prepare signs to provide directional information to construction personnel and visitors.
- J. Temporary Exterior Lighting: Install exterior yard and sign lights so signs are visible when Work is being performed.
- K. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than seven (7) days during normal weather or three (3) days when the temperature is expected to rise above 80°F (27°C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material lawfully.

### **3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION**

- A. Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer, as requested by the Designer.

- B. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of the types needed to protect against reasonable predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers" and NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations".
  - 1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one (1) extinguisher on each floor at or near each usable stairwell.
  - 2. Store combustible materials in containers in fire-safe locations.
  - 3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for fighting fires. Prohibit smoking in hazardous fire-exposure areas.
  - 4. Provide supervision of welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
- C. 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.
- D. Enclosure Fence: Before excavation begins, install an enclosure fence with lockable entrance gates. Locate where indicated, or enclose the entire site or the portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs, and other animals from easily entering the site, except by the entrance gates.
  - 1. Provide open-mesh, chainlink fencing with posts set in a compacted mixture of gravel and earth.
  - 2. Provide plywood fence, 8' (2.5m) high, framed with (4) 2"x4" (50mm x 100mm) rails, and preservative-treated wood posts spaced not more than 8' (2.5m) apart.
- E. Security Enclosure and Lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
  - 1. Storage: Where materials and equipment must be stored and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.
- F. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted or that other undesirable effects might result. Avoid use of tools and equipment that produce harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near the site.

### **3.5 OPERATION, TERMINATION AND REMOVAL**

- A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.

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

**END OF SECTION 01 50 00**



## **SECTION 01 74 00 – CLEANING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

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

### **PART 2 - PRODUCTS**

#### **2.1 MATERIALS**

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

### **PART 3 - EXECUTION**

#### **3.1 PROGRESS CLEANING**

- A. General
  - 1. Retain all stored items in an orderly arrangement allowing maximum access, not impeding drainage or traffic, and providing the required protection of materials.
  - 2. Do not allow the accumulation of scrap, debris, waste material, and other items not required for construction of this Work.
  - 3. At least once 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.

### 3.2 FINAL CLEANING

- A. General: Provide final cleaning operations when indicated. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of Work to the condition expected from a commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
- B. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for the entire Project or a portion of the Project.
1. Clean the Project Site, yard and grounds, in areas disturbed by construction activities including landscape development areas, of rubbish, waste material, litter, and foreign substances.
  2. Sweep paved areas broom clean. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
  3. Remove petrochemical spills, stains, and other foreign deposits.
  4. Remove tools, construction equipment, machinery, and surplus material from the site.
  5. Remove snow and ice to provide safe access to the building.
  6. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
  7. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
  8. Broom clean concrete floors in unoccupied spaces.
  9. 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 electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
  12. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs and defective and noisy starters in fluorescent and mercury vapor fixtures.
  13. Leave the Project clean and ready for occupancy.

- C. Removal of Protection: Remove temporary protection and facilities installed during construction to protect previously completed installations during the remainder of the construction period.
- D. 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 01 74 00**

## **SECTION 03 30 00 - CAST-IN-PLACE CONCRETE**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
  - 1. All concrete paving shall be in accordance with 2020 Missouri Standard Specifications for Highway Construction.

#### **1.2 SUMMARY**

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
  - 1. Slabs-on-grade.
- B. Related Sections:
  - 1. Section 31 20 00 "Earth Moving" for drainage fill under slabs-on-grade.
  - 2. Section 32 13 13 "Concrete Paving" for concrete pavement and walks.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
- C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
- D. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
  - 1. Location of construction joints is subject to approval of the Architect.

#### **1.4 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer, manufacturer and testing agency.
- B. Welding certificates.
- C. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Steel reinforcement and accessories.
4. Adhesives.
5. Joint-filler strips.
6. Repair materials.

D. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:

1. Aggregates.

## 1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

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

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

D. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

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

1. Build panel approximately 200 sq. ft. for slab-on-grade and 100 sq. ft. for formed surface in the location indicated or, if not indicated, as directed by Architect.

F. Preinstallation Conference: Conduct conference at Project site.

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
  - a. Contractor's superintendent.
  - b. Independent testing agency responsible for concrete design mixtures.
  - c. Ready-mix concrete manufacturer.
  - d. Concrete subcontractor.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

## PART 2 - PRODUCTS

### 2.1 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
  - 1. Plywood, metal, or other approved panel materials.
  - 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
    - a. High-density overlay, Class 1 or better.
    - b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
    - c. Structural 1, B-B or better; mill oiled and edge sealed.
    - d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.
- D. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.

### 2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Steel Bar Mats: ASTM A 184/A 184M, fabricated from ASTM A 615/A 615M, Grade 60, deformed bars, assembled with clips.

### 2.3 REINFORCEMENT ACCESSORIES

- A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
  - 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

## 2.4 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
  - 1. Portland Cement: ASTM C 150, Type I or Type III, gray. Supplement with the following:
    - a. Fly Ash: ASTM C 618, Class F or C.
- B. Normal-Weight Aggregates: ASTM C 33, Class 3M coarse aggregate or better, graded. Provide aggregates from a single source. Coarse aggregates shall meet the requirements for use in regions of moderate weathering.
  - 1. Nominal aggregate sizes shall not exceed Maximum Coarse Aggregate Sizes for each Concrete Mixture.
- C. Water: ASTM C 94/C 94M.

## 2.5 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
  - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
  - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
  - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
  - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
  - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
  - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
- 7. Products: Subject to compliance with requirements, [available products that may be incorporated into the Work include, but are not limited to, the following]:
  - a. BASF Construction Chemicals - Building Systems; Rheocrete 222+.
  - b. Cortec Corporation; MCI- 2000 or 2005NS.
  - c. Grace Construction Products, W. R. Grace & Co.; DCI-S.
  - d. Sika Corporation; FerroGard 901.

## 2.6 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, nondissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.

- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, 18 to 25 percent solids, nondissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.

## 2.7 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.
- B. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- C. Reglets: Fabricate reglets of not less than 0.022-inch- thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

## 2.8 REPAIR MATERIALS

- A. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.
  - 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
  - 2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
  - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
  - 4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

## 2.9 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
  - 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.
- C. Admixtures: Use admixtures according to manufacturer's written instructions.
  - 1. Use water-reducing admixture in concrete, as required, for placement and workability.

## 2.10 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Footings: Proportion normal-weight concrete mixture as follows:
  - 1. Minimum Compressive Strength: 4500 psi at 28 days.
  - 2. Maximum Water-Cementitious Materials Ratio: 0.45.



3. Slump Limit:
  - a. Concrete Including a Water-Reducing or Plasticizing Admixture: 7 inches, plus or minus 1 inch.
  - b. Other Concrete: 4 inches , plus or minus 1 inch .
4. Maximum Coarse Aggregate Size: 1-1/2-inch.
5. Air Content: 5.5 percent, plus or minus 1.5 percent at point of deliver.

B. Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4500 psi at 28 days.
2. Minimum Cementitious Materials Content: 540 lb/cu. yd.
3. Slump Limit:
  - a. Concrete Including a Water-Reducing or Plasticizing Admixture: 7 inches, plus or minus 1 inch .
  - b. Other Concrete: 3 inches, plus or minus 1 inch.
4. Maximum Coarse Aggregate Size: 3/4-inch.
5. Air Content:
  - a. Concrete Inside Building Thermal Enclosure: No limit.
  - b. Concrete Outside Building Thermal Enclosure: 5 percent, plus or minus 1.5 percent at point of delivery.
  - c. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.
  - d. Use of air entrainment admixtures is prohibited for concrete scheduled to receive surface hardener.

C. Concrete Toppings: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4500 psi at 28 days.
2. Minimum Cementitious Materials Content: 470 lb/cu. yd.
3. Slump Limit:
  - a. Concrete Including a Water-Reducing or Plasticizing Admixture: 7 inches, plus or minus 1 inch.
  - b. Other Concrete: 4 inches, plus or minus 1 inch.
4. Maximum Coarse Aggregate Size: 3/4-inch.
5. Air Content:
  - a. Concrete Inside Building Thermal Enclosure: No limit.
  - b. Concrete Outside Building Thermal Enclosure: 5 percent, plus or minus 1.5 percent at point of delivery.
  - c. Air Content: Do not allow air content of trowel-finished toppings to exceed 3 percent.

## 2.11 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

## 2.12 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and furnish batch ticket information.
  - 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
  - 1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
  - 2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd..
  - 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

## PART 3 - EXECUTION

### 3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
  - 1. Class A, 1/8 inch for smooth-formed finished surfaces.
  - 2. Class B, 1/4 inch for rough-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
  - 1. Install keyways, reglets, recesses, and the like, for easy removal.
  - 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

- H. Chamfer exterior corners and edges of permanently exposed concrete, as indicated.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

### 3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

### 3.3 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, and slabs and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.
  - 1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved 85% its 28-day design compressive strength.
  - 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

### 3.4 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

### 3.5 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
  - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
  - 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
  - 3. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
  - 4. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
  - 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch . Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
  - 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
  - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
  - 2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, are indicated.
  - 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
  - 4. Unless indicated, construct isolation joints in exterior paving at intervals not to exceed 40 ft.

### 3.6 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
  - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
  - 1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
  - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
  - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- D. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
  - 1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
  - 2. Maintain reinforcement in position on chairs during concrete placement.
  - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
  - 4. Slope surfaces uniformly to drains where required.
  - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- E. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
  - 1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
  - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
  - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- F. Hot-Weather Placement: Comply with ACI 301 and as follows:
  - 1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of

ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

### 3.7 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
  1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
  1. Apply to concrete surfaces exposed to public view, to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

### 3.8 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraighening until surface is left with a uniform, smooth, granular texture.
  1. Apply float finish to surfaces to receive trowel finish and to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.
- C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
  1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
  2. Finish surfaces to the following tolerances, according to ASTM E 1155 for a randomly trafficked floor surface:
    - a. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17.

- 1) Minimum local values of levelness, F(L) for slabs other than on-grade are not limited.
- D. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.
1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

### 3.9 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations:
1. Coordinate sizes and locations of concrete bases with actual equipment provided.
  2. Construct concrete bases 4 inches high unless otherwise indicated; and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated or unless required for seismic anchor support.
  3. Minimum Compressive Strength: 4500 psi at 28 days.
  4. Install #4 dowels to connect concrete base to concrete floor. Unless otherwise indicated, install #4 dowels on 18-inch centers around the full perimeter of concrete base with a minimum of 4 dowels per base.
  5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base, and anchor into structural concrete substrate.
  6. Prior to pouring concrete, place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  7. Cast anchor-bolt insert into bases. Install anchor bolts to elevations required for proper attachment to supported equipment.

### 3.10 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
  - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
    - a. Water.
    - b. Continuous water-fog spray.
    - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
  - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
    - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
    - b. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.
  - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
    - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.
  - 4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

### 3.11 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.



1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
  2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
  3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
  2. After concrete has cured at least 14 days, correct high areas by grinding.
  3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
  4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
  5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
  6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
  7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Architect's approval.

### 3.12 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Contractor will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
  - 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof. One set of four specimens is required for concrete pours of an amount less than five cubic yards, if the concrete is to be part of the building structural system (i.e. footings, piers, walls)
    - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
  - 2. Additional Specimens. At Contractors option and expense additional specimens and testing shall be coordinated by the Contractor in the event that testing prior to 7 days is desirable due to scheduling.
  - 3. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
  - 4. Air Content: ASTM C 231, pressure method, for normal-weight concrete; test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
  - 5. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
  - 6. Compressive Strength Test Specimen: ASTM C 31; one set of 4 standard cylinders for each compressive-strength test, unless otherwise directed. Mold and store cylinders as laboratory-cured specimens except when field-cured test specimens are required.
  - 7. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at 7 days, two specimens at 28 days and retain one specimen in reserve for later testing if required.
    - a. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength and no individual strength test falls below specified compressive strength by more than 500 psi.
  - 8. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
  - 9. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
  - 10. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.

11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
  12. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- C. Measure floor and slab flatness and levelness according to ASTM E 1155 within 24 hours of finishing.

END OF SECTION 03 30 00

## **SECTION 26 05 00 - ELECTRICAL GENERAL PROVISIONS**

### **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 work of this Section.

#### **1.2 DESCRIPTION OF WORK**

- A. The work included under this Section consists of providing all labor, materials, supervision, and construction procedures necessary for the installation of the complete electrical systems required by these specifications and/or shown on the drawings of the contract.
- B. The Contract Drawings are shown in part diagrammatic intended to convey the scope of work, indicating the intended general arrangement of equipment, conduit, and outlets. Follow the drawings in laying out the work and verify spaces for the installation of the materials and equipment based on the dimensions of actual equipment furnished. Whenever a question exists as to the exact intended location of outlets or equipment, obtain instructions from the Engineer before proceeding with the work.

#### **1.3 QUALITY ASSURANCE**

Installers shall have at least 2 years of successful installation experience on projects with electrical installation work similar to that required by the project. All equipment and materials shall be installed in a neat and workmanlike manner and shall be aligned, leveled, and adjusted for satisfactory operation.

#### **1.4 REFERENCES**

- A. The design, manufacture, testing, and method of installation of all equipment and materials furnished under the requirements of this specification shall conform to the following codes, standards and regulations, etc.:
  - 1. Safety and Health Regulations for Construction.
  - 2. Occupational Safety and Health Standards, National Consensus Standards and Established Federal Standards.
  - 3. National Electrical Code (NEC).
  - 4. American National Standards Institute (ANSI).
  - 5. National Electric Manufacturer's Association (NEMA).
  - 6. Institute of Electrical and Electronic Engineers (IEEE).
  - 7. National Fire Protection Association (NFPA).
  - 8. Insulated Cable Engineers Association (ICEA).
  - 9. American Society for Testing and Materials (ASTM).
  - 10. Life Safety Code NFPA #101.
  - 11. Underwriters Laboratories, Inc. Standards (UL).
  - 12. Factory Mutual Engineering Corporation or other recognized National Laboratories.
  - 13. National Electrical Safety Code (NESC).
- B. The latest adopted edition by the local and state inspection authorities of all standards and specifications listed above shall apply.

- C. Furthermore, the electrical work shall be in accordance with all applicable National and State Standards, and Local Codes and Building Ordinances. The electrical work shall merit the approval of the enforcing authorities having jurisdiction.

## 1.5 MATERIALS AND EQUIPMENT

- A. Electrical materials and equipment for the entire project shall meet the requirements specified under the Supplementary Conditions Section of this specification.
- B. Equipment and fixtures shall be connected to provide circuit continuity in accordance with applicable Codes whether or not each piece of conductor, conduit, or protective device is shown between such items of equipment or fixtures and the point of circuit origin.
- C. The electrical work includes the installation or connection of certain materials and equipment furnished by others. Verify all connection details.
- D. All equipment over 50 pounds shall be provided with adequate lifting means.

## 2. PRODUCTS (NOT USED)

## 3. EXECUTION

### 3.1 ACCESS TO EQUIPMENT

- A. Starters, switches, receptacles, pull boxes, etc. shall be located to provide easy access for operation, repair and maintenance. If the devices listed above are concealed, access doors shall be provided.

### 3.2 SUBMITTALS

- A. Test Reports: Provide the tests as outlined in this specification and all other tests necessary to establish the adequacy, quality, safety, completed status, and suitable operation of each electrical system. Provide the Engineer with a complete schedule of all tests.
  - 1. Ground Rod Test: Immediately after installation, test driven grounds and counterpoises with a ground resistance direct-reading single-test megger, using the AC fall-of-potential method and two reference electrodes. Orient the ground to be tested and the two reference electrodes in a straight line spaced 50 feet apart. Drive the reference electrodes five feet deep. Disconnect the ground rod to be tested from other ground systems at the time of testing. The ground resistance for the electrical service must be 15 Ohms or less. Submit the results, date of test, and soil conditions to the Engineer in writing immediately after testing.
  - 2. Final Tests: Start final tests after complete preliminary tests have been made which indicate adequacy, quality, completion, and satisfactory operation of all electrical systems. Included in these tests are the following:
    - a. Completion of the form "Electrical Test Report" (attached to the end of this specification section) in sufficient quantity to provide the indicated information for each panelboard and switchboard in the project.
  - 3. The Contractor shall submit the above completed reports to the Engineer, noting all deviations from the requirements listed below:

- a. Plus or minus five percent variation between nominal system voltage and no load voltage, or plus or minus five percent variation between no load and full load voltage.
    - b. Plus five-percent variation between rated and actual motor current.
    - c. Plus or minus ten percent variation between average phase current and measured individual phase current. The Contractor shall balance phase currents of all distribution equipment within the tolerances specified.
    - d. Insulation resistance between conductors and ground of not less than 1,000,000 Ohms.
  4. Final Corrections: Correct promptly any failure or defects revealed by these tests as determined by the Engineer. Reconduct tests on corrected items as directed by the Engineer.
- B. Operation and Maintenance Manuals: Operation and Maintenance Manuals shall be provided according to Division 1 requirements. In general, during the time of the contract, and before substantial completion of the electrical installation, submit to the Engineer the number of copies described in the Division 1 specifications and the General and Supplemental Conditions copies of descriptive literature, maintenance recommendations (from the equipment manufacturer), data on initial operation, wiring diagrams, performance curves, engineering data and tests, operating procedures, routine maintenance procedures, and parts lists for each item of electrical equipment installed under this contract and submit all manufacturer's guarantees and warranties.
- C. Shop Drawings: The Contractor shall furnish shop drawing portfolios and proper transmittal forms for all materials, equipment, and lighting fixtures to be incorporated in the work in accordance with the General Conditions, Supplementary Conditions, and all other applicable Conditions.
1. Shop drawings on component items forming a system or that are interrelated shall be submitted at one time as a single submittal in order to demonstrate that the items have been properly coordinated and will function properly as a system. A notation shall be made on each shop drawing submitted as to the item's specific use, either by a particular type number referenced on the drawings or in the specifications, by a reference to the applicable paragraph of the specifications, or by a description of its specific location. The shop drawings shall be organized and bound into sets with each set collated.
  2. The Engineer shall have the final authority as to whether the equipment or material submitted is equal to the specified item. Proposed substitutions may be rejected for aesthetic reasons if felt necessary or desirable. In the event the proposed substitutions are rejected, the Contractor shall furnish the specified item.
- D. A Short Circuit study shall be provided by the contractor for this project. The study shall include maximum short circuit calculations, and settings for all protective devices with adjustable set points. The study shall be based on the specific devices installed and include all **new equipment** (but not be limited to) the following:
1. Service Entrance Equipment.
    - a. All overcurrent protective devices installed in service entrance panels/switchboards.
  2. Feeder Circuits.
    - a. All three (3) phase feeder circuit overcurrent protective devices.

3. Branch Circuits.
    - a. All three (3) phase branch circuit overcurrent protective devices. installed with a rating equal to or greater than 30 amps.
    - b. All motor circuit overcurrent protective devices for motors with a rating equal to or greater than 10 horse power.
  4. Format
    - a. The preliminary study should be submitted to the Owner's Representative no later than six (6) weeks after overcurrent protective device shop drawings have been reviewed.
    - b. The study shall be reviewed and updated to reflect any changes within one week of the final electrical walk through for project.
    - c. The low voltage study shall include the stamp or seal and signature of the preparing engineer, and shall be reviewed by the Engineer of Record.
    - d. A complete set of manufacturers' descriptive literature and detailed instructions for adjusting overcurrent protective devices shall be provided to the Owner's Representative within six (6) weeks after overcurrent protective device shop drawings have been approved.
    - e. The low voltage study shall be provided using the SKM Systems Analysis, Inc SKM Power Tools Electrical Engineering Software (PTW 32).
    - f. Prior to project completion, the low voltage study shall be provided to the Owner's Representative in both hard copy and on computer disk. The hard copy shall include time current curves (for phase and ground fault settings) for each panel and the corresponding TCC report clearly showing each device set point. The computer disk shall include the complete coordination file including all device curves (use the SKM "Project - Backup" command).
- E. A low voltage Arc Flash Hazard Analysis shall be provided by the contractor for this project. The analysis shall be based on the specific equipment installed, and shall be updated to include project "as built" documentation. Where the arc flash hazard/risk category is equal to or greater than level 3, the overcurrent protective device coordination study shall be reviewed and recommendations shall be provided to reduce the hazard/risk level. The analysis shall be based on the specific devices installed and include all **new equipment** (but not be limited to) the following:
1. Service Entrance Equipment.
    - a. All overcurrent protective devices installed in service entrance panels/switchboards.
  2. Feeder Circuits.
    - a. All three (3) phase feeder circuit overcurrent protective devices.
  3. Branch Circuits.
    - a. All three (3) phase branch circuit overcurrent protective devices installed with a rating equal to or greater than 30 amps.
    - b. All motor circuit overcurrent protective devices for motors with a rating equal to or greater than 10 horse power.
  4. The project shall include printed waterproof labels for equipment that lists the specific arc flash hazard/risk category at each location.

## 5. Format

- a. A preliminary Arc Flash Hazard Analysis should be submitted to the Owner's Representative no later than six (6) weeks after the overcurrent protective device shop drawings have been reviewed.
- b. The Arc Flash Hazard Analysis shall be reviewed and updated to reflect any changes and corrections to conductor length within one week of the final electrical walk through for the project.
- c. The low voltage arc flash hazard analysis shall include the stamp or seal and signature of the preparing engineer, and shall be reviewed by the Engineer of Record.
- d. Owner approved Arc Flash Hazard warning labels shall be furnished and installed prior to project completion.
- e. The low voltage arc flash hazard analysis shall be provided using the SKM Systems Analysis, Inc SKM Power Tools Electrical Engineering Software (PTW 32).
- f. Prior to project completion, the low voltage arc flash hazard analysis shall be provided to the Owner's Representative in both hard copy and on computer disk. The hard copy shall clearly show each device set point. The computer disk shall include the complete coordination file including all device curves (use the SKM "Project - Backup" command).

### 3.3 EXISTING UTILITIES

- A. The Contractor shall verify the location of all existing utilities with the Owner and Utility providers prior to commencing excavation work. In addition, the contractor is responsible for locating and maintaining all existing utilities without damage. Fully coordinate all new underground utility work with existing utilities on the site. The drawings and survey data of the contract documents indicate the available information on the existing power and communication services, and on new services to be provided to the project by utility provider. Accuracy of this information is not assured.

### 3.4 ELECTRICAL SERVICE

- A. The Contractor shall provide all material for the connection of the new electrical service as shown on the plans. The Contractor shall also meet all equipment requirements of the **Whiteman Air Force Base Energy and Utilities**. The Contractor shall provide all necessary materials for construction of the temporary electrical service and shall coordinate all details with the **Whiteman Air Force Base Energy and Utilities**.

### 3.5 ELECTRICAL PRODUCT COORDINATION

- A. Refer to Division 2 through Division 32 and the electrical drawings for the power characteristics required and available for the operation of each power-consuming item of equipment. Coordinate purchases to ensure uniform interface with every item requiring electrical power.

### 3.6 CUTTING AND PATCHING

- A. The Electrical Contractor shall be responsible for all cutting and patching of holes in building construction which are required for the passage of electrical work. Cutting and patching shall conform to the requirements of Division 1 and, if applicable, Division 2 of these specifications.
- B. Cutting of structural framing, walls, floors, decks and other members intended to withstand stress is not permitted.



### 3.7 PAINTING, FINISHING

- A. Painting of electrical work exposed in occupied spaces, except mechanical and electrical machine rooms and maintenance/service spaces; and work exposed on the exterior of the facility is specified and performed under other divisions of these specifications.
- B. Factory finishes, shop priming, and special protective coatings are specified in the individual equipment specification sections.
- C. Where factory finishes are provided on equipment and no additional field painting is specified, all marred or damaged surfaces shall be touched up or refinished so as to leave a smooth, uniform finish at the time of final inspection.

### 3.8 EXCAVATION AND BACKFILLING

- A. Contractor shall perform all excavation and backfilling necessary to install the required electrical work. Coordinate the work with other excavating and backfilling work in the same area. Except as indicated otherwise, comply with the applicable sections in Division 31 of these specifications, excavation filling and backfilling (for structures) to 5' outside the building line, and exterior utilities sections for beyond 5' from the building line.
- B. Landscape work, pavement, flooring and similar exposed finish work that is disturbed or damaged by excavation shall be repaired and restored to their original condition by the Contractor.

### 3.9 CONDUITS AND SUPPORT, GENERALLY

- A. Conduits, except electrical conduits run in floor construction, shall be run parallel with or perpendicular to lines of the building unless otherwise noted on the drawings. Electrical conduits shall not be hung on hangers with any other service, unless specifically approved by the Engineer. Electrical conduits shall be hung above all other service pipes. Hangers on different service lines running close to and parallel with each other shall be in line with each other and parallel with, or perpendicular to, the lines of the building. Exact location of electric outlets, piping, ducts, and the like shall be coordinated to avoid interferences between lighting fixtures, piping, ducts, and similar items.

### 3.10 ACCESS PANELS

- A. Furnish and install panels for access to junction boxes and similar items where no other means of access, such as a readily removable, sectional ceiling is shown or specified.
- B. Panels shall not be less than 12-inches by 16-inches in size. Larger panels shall be furnished where required. Panels in tile or other similar patterned ceilings shall have dimensions corresponding to the tile or pattern module.

### 3.11 INSTALLATION OF EQUIPMENT

- A. Install and connect all appliances and equipment as specified and indicated for this project, in accordance with the manufacturers' instructions and recommendations. Furnish and install complete electric connections and devices as recommended by the manufacturer or required for proper operation.

### 3.12 ELECTRICAL DEMOLITION

- A. Refer to Division 01 Sections for general demolition requirements and procedures.

- B. Refer to the drawings for additional demolition requirements.
- C. Disconnect, demolish, and remove electrical systems, equipment and components specified under Divisions 26, 27 & 28 and as indicated on the drawings.
  - 1. For conductors serving devices shown to be removed: Disconnect the device and remove all conduit and conductors back to the panel or to the next device shown to remain or as required by actual circuiting.
  - 2. Coordinate all phasing and related electrical system outages with the Owner and all other disciplines.
  - 3. For mechanical equipment indicated shown to be removed on either the mechanical and/or the electrical plans: Disconnect the equipment and remove all conduit, conductors and associated electrical supply equipment. Remove conduit and conductors back to the panel or the next device shown to remain or as required by actual circuiting.

### 3.13 COORDINATION

- A. Coordinate the electrical work with work of the different trades so that:
  - 1. Interferences between mechanical, electrical, architectural, and structural work, including existing services, will be avoided.
  - 2. Within the limits indicated on the drawings, the maximum practicable space for operation, repair, removal and testing of electrical and other equipment will be provided.
  - 3. Pipe, conduits, ducts, and similar items, shall be kept as close as possible to ceiling, walls, and columns, to take up a minimum amount of space. Pipes, conduits, ducts, and similar items shall be located so that they will not interfere with the intended use of other equipment.
- B. Furnish and install, without additional expense to the Owner, all offsets, fittings and similar items necessary in order to accomplish the requirements of coordination.
- C. Any work installed prior to approval of coordination drawings shall be at the Contractor's risk. Subsequent relocations required to avoid interference's shall be made without additional expense to the Owner.

### 3.14 SINGULAR NUMBER

- A. Where any device or part of equipment is herein referred to in the singular number (such as "the switch"), such reference shall be deemed to apply to as many such devices as are required to complete the installation as shown on the drawings.

### 3.15 WARRANTY

- A. Refer to the General Conditions section of this Specification for warranty requirements and information.

### 3.16 CLOSE OUT AND OPERATION INSTRUCTIONS

- A. Sequence operations properly so that all work of this project will not be damaged or endangered. Operate each item of equipment and each system in a test run of appropriate duration to demonstrate sustained, satisfactory performance. Adjust and correct operations as required for proper performance.
- B. Conduct a full-day walk-through instruction seminar for the Owner's personnel to be involved in the continued operation and maintenance of electrical equipment and systems. Explain the

identification system, operational diagrams, emergency and alarm provisions, sequencing requirements, security, safety, efficiency and similar features of the systems.

- C. At the time of substantial project completion, turn over the prime responsibility for operation of the electrical equipment and systems to the Owner's operating personnel. Until the time of final acceptance, provide full time operating personnel, who are completely familiar with the work, to consult with and continue training the Owner's personnel.

#### SUBSTITUTIONS

- D. All proposals shall be based on providing and installing the materials or items of equipment which are hereinafter specified by name and/or manufacturer. Substitutions, for materials or items of equipment specified, will not be allowed, unless approved by Engineer prior to (10 days before) bid date.
- E. Refer to Instructions to Bidders for complete requirements for substitutions.

#### 3.17 AS-BUILT DRAWINGS

- A. Contractor shall provide the Owner with as-built drawings for all electrical systems as described in these specifications and/or shown on the Drawings.

END OF SECTION 26 05 00

# ELECTRICAL TEST REPORT

DATE: \_\_\_\_\_

SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_

PROJECT NAME: \_\_\_\_\_

PROJECT NUMBER: \_\_\_\_\_

|                              |  |
|------------------------------|--|
| SERVICE<br>TRANSFORMER SIZE  |  |
| NO LOAD<br>SERVICE VOLTAGE   |  |
| FULL LOAD<br>SERVICE VOLTAGE |  |

|                                  |       |   |   |       |   |   |       |   |   |
|----------------------------------|-------|---|---|-------|---|---|-------|---|---|
| DESIGNATION                      |       |   |   |       |   |   |       |   |   |
| LOCATION                         |       |   |   |       |   |   |       |   |   |
| MEASURED<br>CONDITIONS           | PHASE |   |   | PHASE |   |   | PHASE |   |   |
|                                  | A     | B | C | A     | B | C | A     | B | C |
| NO LOAD FEEDER<br>VOLTAGE        |       |   |   |       |   |   |       |   |   |
| OPERATING LOAD<br>FEEDER VOLTAGE |       |   |   |       |   |   |       |   |   |
| OPERATING LOAD<br>FEEDER CURRENT |       |   |   |       |   |   |       |   |   |

|                                  |       |   |   |       |   |   |       |   |   |
|----------------------------------|-------|---|---|-------|---|---|-------|---|---|
| DESIGNATION                      |       |   |   |       |   |   |       |   |   |
| LOCATION                         |       |   |   |       |   |   |       |   |   |
| MEASURED<br>CONDITIONS           | PHASE |   |   | PHASE |   |   | PHASE |   |   |
|                                  | A     | B | C | A     | B | C | A     | B | C |
| NO LOAD FEEDER<br>VOLTAGE        |       |   |   |       |   |   |       |   |   |
| OPERATING LOAD<br>FEEDER VOLTAGE |       |   |   |       |   |   |       |   |   |
| OPERATING LOAD<br>FEEDER CURRENT |       |   |   |       |   |   |       |   |   |

## **SECTION 26 05 01- BASIC MATERIALS AND METHODS**

### **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 work of this Section.

#### **1.2 DESCRIPTION OF WORK**

- A. The extent of Basic Materials and Methods is indicated by the drawings and specifications. Basic materials are defined but not limited to cable and conduit seals, outlet boxes, pull boxes, conduit fittings, safety switches, and fuses.

#### **1.3 QUALITY ASSURANCE**

- A. Manufacturers: All materials shall be new, unused, and unweathered, and of the quality specified. Materials shall be standard products of manufacturer's regularly engaged in the production of such equipment and shall be the manufacturer's latest standard design.
- B. Installer: All equipment and materials shall be installed in a neat and workmanlike manner, shall be complete in both effectiveness and appearance, whether finally concealed or exposed and shall be executed by experienced mechanics.

#### **1.4 REFERENCES**

- A. The electrical work shall conform to all applicable sections of standards, codes and specifications promulgated by organizations listed below.
  - 1. Occupational Safety and Health Standard, National Consensus Standards and Established Federal Standards
  - 2. National Electrical Code (NEC)
  - 3. National Electric Manufacturer's Association (NEMA)
  - 4. American Society for Testing of Materials (ASTM)
  - 5. Underwriters Laboratories, Inc. Standards (UL)
  - 6. Factory Mutual Engineering Corporation or other Recognized National Laboratories

#### **1.5 SUBMITTALS**

- A. Shop drawings: Prepare a set of shop drawings showing manufacturers product data for all component parts specified in this Section.

### **2. PRODUCTS**

- 2.1 Equipment and Materials Furnished by Others: Certain materials and equipment for this project will be furnished under other divisions. These materials and equipment, which are shown or noted on the plans, will be installed and/or connected under this Division. It shall be incumbent upon this Contractor to become familiar with all of the materials and equipment that will be furnished under other Divisions, but which will be installed and/or connected under this Division.

2.2 Cable and Conduit Seals: Seals shall be provided around all conduits and cables which penetrate smoke walls, fire walls, and floors. Nelson Flameseal System shall be used to seal penetrations of electrical cables and conduits.

- A. Materials used shall be flameseal putty, ceramic fiber insulation and where rigid support on large oversized openings is required, ceramic fiber board. Board shall be rigid and able to withstand temperatures in excess of 2000 degrees F.
- B. Accessory hardware shall be provided as required on oversized openings.
- C. Follow manufacturers instructions in selecting the type of seals and accessories. Also follow the manufacturers instructions on installation of the cable and conduit seals. Equal quality equipment by OZ Gedney and 3M shall be acceptable.

2.3 Outlet Boxes, Pull Boxes and Conduit Fittings: Furnish and install outlet boxes, pull boxes, and conduit fittings as described below. Catalog numbers shown are Appleton Electric Company; Steel City, O.Z. Gedney, and Raco, are equally acceptable.

A. OUTLET BOXES

- |  |   |
|--|---|
| 1. Lighting Boxes (concealed)  | No. 40-3/4  |
| 2. Lighting Boxes (concrete)   | OCR Series  |
| 3. Lighting Boxes (exposed)  | 4S-3/4 or 40-3/4  |
| 4. Flush Switches, Receptacles<br>Telecommunications and Flush<br>Junction Boxes     | No. 4S-3/4 with separate<br>extension plaster ring; M*-250<br>in masonry construction (* refers<br>to number of devices in the box) |
| 5. Weatherproof type Switch,<br>Receptacle and Telecommunications<br>Boxes (exposed) | FS Series w/FS cover and<br>neoprene gasket.  |
| 6. Switch, Receptacle and<br>Telecommunications Boxes (exposed)                      | 4S-3/4 with 8360 or 8370<br>series raised surface cover.  |

- B. Extension and plaster rings shall be installed as required by the NEC.
- C. Outlet boxes shall comply with the National Electrical Code in regard to the allowable fill.

2.4 PULL BOXES

- A. Pull boxes shall be fabricated of code gauge galvanized sheet metal and shall be sized in accordance with the National Electrical Code requirements or as shown on the drawings. Provide removable cover on the largest access side of the box. In-line conduit pull boxes may be O.Z., Type PBW, or equal. Provide pull boxes at all code required locations, and as needed to aid in cable pulling.

2.5 SAFETY SWITCHES

- A. Furnish and install heavy duty type safety switches, having the electrical characteristics, ratings and modifications shown on the drawings. All switches shall have:
- B. NEMA 1 general purpose enclosures unless otherwise noted for all interior applications;
- C. NEMA 3R rainproof enclosures unless otherwise noted for all exterior applications;
- D. Fully rated neutral assemblies;
- E. Equipment grounding kits;
- F. Metal nameplates, front cover mounted that contain a permanent record of switch type, catalog number and H.P. ratings with both standard and time delay fuses;
- G. Handle that is padlockable in "OFF" position;
- H. Non-teasible, positive quick-make, quick-break mechanism;
- I. UL approval and shall bear the UL label;
- J. All fusible switches shall have Class R Fuse rejection clips.
- K. Safety switches, as manufactured by the following, will be equally acceptable, but all safety switches furnished by this Contractor shall be the product of one manufacturer:
  - 1. Square D Company
  - 2. General Electric
  - 3. Cutler Hammer
  - 4. Siemens

## 2.6 FUSES

- A. Fuses shall be furnished and installed in each fused switch, and shall be rated as shown on the drawings.
- B. Provide fuses according to the following and in accordance with recommendations of manufacturers whose equipment is being protected:
  - 1. Provide UL Class L current limiting time-delay fuses rated 600-volts, 60 Hz, 601 to 6000 amps, with 200,000A RMS symmetrical interrupting current rating for protecting transformers, motors and circuit breakers. (Similar to Buss Low-Peak fuses.)
  - 2. Provide UL Class L current limiting fast-acting fuses rated 600-volts, 60 Hz, 601 to 6000 amps, with 200,000A RMS symmetrical interrupting current rating for protecting service entrances and main feeder circuit breakers. (Similar to Buss Limitron fuses.)
  - 3. Provide UL Class RK1 current limiting, dual-element, time-delay fuses rated 600-volts, 60 Hz, 1/10 to 600 amps, with 200,000A RMS symmetrical interrupting current rating for protecting motors and circuit breakers. (Similar to Buss Low-Peak fuses.)
  - 4. Provide UL Class RK1 current-limiting fuses rated 250-volts, 60 Hz, 1/10 to 600 amps, with 200,000A RMS symmetrical interrupting current for protecting motors and circuit breakers. (Similar to Buss Low-Peak fuses.)

5. Provide UL Class J current-limiting fuses rated 600-volts, 60 Hz, 1 to 600 amps, with 200,000A RMS symmetrical interrupting current rating for protecting circuits with no heavy inrush current where reduced dimension devices are required.
  6. Provide UL Class H fuses rated 600-volts, 60 Hz, 1/10 to 600 amps, with 10,000A RMS symmetrical interrupting current rating for protecting general purpose light duty feeders.
  7. Provide UL Class T fuses rated 600-volts, 60 Hz, 1 to 1,200 amps, with 200,000A RMS symmetrical interrupting current rating for protection of non-motor loads where reduced dimension devices are required.
- C. Three spare fuses shall be furnished for each size and type used. Each fused switch shall be provided with a mastic backed label clearly identifying the type and size of fuse required.

### 3. EXECUTION

#### 3.1 PRODUCT INSTALLATION, GENERAL

- A. Except where more stringent requirements are indicated, comply with product manufacturer's installation instructions and recommendations, including handling, anchorage, assembly, connections, cleaning and testing.

#### 3.2 MOUNTING HEIGHTS

- A. Mounting heights to the center of the box above finished floor for the items listed below shall be as follows, unless otherwise shown. All other device mounting heights shall be as shown on the drawings. All devices shall be mounted in accordance with ADA (Americans with Disabilities Act) requirements.
- |  |  |
|--|--|
| B. Flush tumbler switches and lighting controls  | 46"  |
| C. Switches in concrete block  | 46"  |
| D. Convenience outlets<br>prong  | 18" mounted vertically with ground<br>slot at bottom |
| E. Safety switches   | 54"  |
| F. Motor controllers   | 54"  |
| G. Panelboards to top  | 72"  |
| H. Receptacles above counters  | 8" above counters mounted<br>vertically              |
| I. Convenience outlets in<br>mechanical, electrical, telecommunications, janitor<br>and elevator machine rooms | 48"  |
| J. Exterior W.P. convenience<br>outlets<br>And/or strobe   | 24" above grade mounted                              |
| K. Contractor shall check all equipment layouts and verify exact mounting heights.                             |  |



### 3.3 CUTTING AND PATCHING FLOORS, WALLS OR CEILINGS

- A. Cutting, patching, repairing, and finishing of carpentry work, metal work, or concrete work, etc., which may be required for this work shall be done by craftsmen skilled in their respective trades. When cutting is required, it shall be done in such a manner as not to weaken walls, partitions, or floors. Holes required to be cut in floors must be drilled without breaking out around the holes. Cutting, patching, and painting shall conform to the requirements of the General Conditions section of this Specification.
- B. Cutting of structural framing, walls, floors, decks, or other members intended to withstand stress is not permitted.
- C. Sleeves through floors or walls shall be black iron pipe and shall be flush with finished faces of floors, walls or ceilings. Sleeves shall be sized to accommodate raceways indicated.
- D. Use care in piercing water proofing. After the part piercing the waterproofing has been set in place, seal openings, and make absolutely watertight.

### 3.4 SLEEVES

- A. Sleeves shall be used to accommodate conduit or tubing where conduit or tubing pass through newly poured concrete walls or slabs.
- B. All sleeves through floors and walls shall be black iron pipe, flush with walls or finished floors; and of sizes to accommodate the raceways shown. Sleeves through outside walls above grade shall be caulked with approved caulking compound. Sleeves shall not be required through on grade slabs.
- C. For raceways which enter buildings below grade, install manufactured floor and thruwall seals, similar to Type "FSK" or "WSK" as manufactured by O.Z. Electric Manufacturing Co.

### 3.5 INSTALLATION METHODS

- A. Conductors shall be installed in concealed raceways except as shown otherwise on the drawings or specified to be otherwise in these specifications. Exposed conduits and wires shall be installed parallel or perpendicular to building surfaces. Conduits and wires in the space above ceilings shall be supported adequately and shall not be laid on the top of ceiling systems. Conduits and wires installed above ceilings shall be considered exposed.
- B. Electrical conduits shall not be hung on hangers with any other service foreign to the electrical systems, nor shall they be attached to other foreign services.
- C. The lighting and power branch circuit conductors shall be installed in separate raceway systems unless specifically shown or noted otherwise.
- D. Equipment Bases. Provide concrete equipment bases for all floor mounted equipment furnished under this contract. Concrete bases shall be 3-1/2"-inches high unless noted otherwise and shall extend 3-inches beyond all sides of the unit. Trowel all edges at a 45 degree angle. This work shall be done in accordance with Division 3 of the specifications by the Division 26 Contractor. Bases shall be provided for switchboards, motor control centers, transformers and all other floor mounted equipment.

- E. Outlet Box Locations. Outlet boxes shall be located so they are not placed back-to-back in the same wall, and in metal stud walls, are separated by at least one stud space in order to limit sound transmission from room to room. Outlet boxes installed on opposite sides of fire rated walls shall be spaced at least 24" apart.

### 3.6 WIRING - NUMBER OF WIRES REQUIRED

- A. The number of wires for lighting and receptacle branch circuits is shown on the drawings. The number of wires in any circuit is determined in accordance with the National Electrical Code, and wiring is provided to perform all functions of the devices being installed. Additionally, wires shall be provided as required by the contract documents, i.e. equipment grounds, etc. Provide the number of wires required for a complete and workable system.

### 3.7 PROTECTION FROM WEATHER

- A. Raceway stub ups shall be capped or otherwise protected from moisture and debris until such time that the conductors are pulled. Conductors shall not be installed in raceways until the building is protected from the weather, all concrete and plastering is completed, and raceways in which moisture has collected have been swabbed or blown out.

### 3.8 ELECTRICAL ROOM COORDINATION

- A. Where a number of electrical panels and/or related electrical items are shown, the Electrical Contractor shall coordinate the physical sizes with his equipment suppliers to ensure that there is adequate space for the items shown to be installed in those areas and that all Code required clearances are maintained.
- B. The Contractor shall rearrange the equipment layout to achieve full use of the available space prior to installing conduit stub ups. Where a conflict or rearrangement exists, the Contractor shall submit a proposed revised layout of the area to the Engineer.

### 3.9 NAMEPLATES

- A. Nameplates shall be provided for all items such as panelboards, cabinets, motor controllers (starters), safety switches, separately enclosed circuit breakers, individual breakers and controllers in switchboards and motor control centers, control devices and other significant equipment
- B. Nameplates shall be 1"x 2-1/2" laminated black phenolic resin with a white core with engraved lettering, a minimum of 3/16-inch high. Manufacturers factory installed nameplates shall be acceptable provided all information is furnished.
- C. Nameplates shall identify the equipment item that the device is serving and also from where the device is being fed from. Nameplates shall also identify the system voltage of the item of equipment.
- D. Namesplates shall also be provided listing calculated SCCR at the main service distribution equipment and elevator controllers in accordance with NEC requirements.

### 3.10 RACEWAY SUPPORTS

- A. Raceways shall be securely supported and fastened in place with pipe straps, wall brackets, caddy clips, hangers or trapeze hangers at intervals specified in Section 26 05 33 "RACEWAYS" or:
  - 1. As shown on the drawings.
  - 2. As may be required by special adverse field conditions.
- B. Spring tension clamps on building steel work may be used only by special permission.
- C. Fastenings shall be by wood screws or screw-type nails to wood; by toggle bolts on hollow masonry units; by expansion bolts on concrete or brick; by machine screws or welded threaded studs on steel work. Nail-type nylon anchors or threaded studs driven in by a powder charge and provided with lock washers and nuts may be used in lieu of expansion bolts or machine wood screws. Threaded C-clamps shall not be used. Raceways or pipe straps shall not be welded to steel structures. Holes cut in reinforced concrete beams or in concrete joists shall avoid cutting the main reinforcing bars. Holes not used shall be filled. In partitions of light steel construction, sheet-metal screws may be used, and bar hangers may be attached with saddle ties of not less than No. 16 AWG double strand zinc-coated steel wire. No raceway shall be attached to the suspended ceiling construction. Conduits shall be fastened to all sheet-metal boxes and cabinets with two locknuts and insulating bushings.

### 3.11 BOX SUPPORTS

- A. Boxes and supports shall be fastened to wood with wood screws or screw-type nails of equal holding strength, with bolts and expansion shields on concrete or brick, with toggle bolts on hollow masonry units, and with machine screws or welded studs on steel work. Plastic expansion shields shall not be used. Threaded studs driven in by powder charge and provided with lockwashers and nuts may be used in lieu of wood screws, expansion shields, or machine screws. In open overhead spaces, cast metal boxes threaded to raceways need not be separately supported except where used for fixture support; cast metal boxes having threadless connectors and sheet metal boxes shall be supported directly from the building structure or by bar hangers. Raceways shall be supported with an approved type fastener not more than 24-inches from the box. Penetration into reinforced concrete beams and into reinforced-concrete joists shall avoid cutting any main reinforcing steel.

### 3.12 LIGHTING FIXTURE SUPPORTS

- A. Lighting fixtures shall be supported as follows and in accordance with all applicable Codes and Regulations:
  - 1. By fixture studs or other devices securely attached to outlet box, or;
  - 2. By special hangers designed and intended for use as lighting fixture supports, or;
  - 3. By a special clip or device attached to the ceiling system grid designed to secure the lighting fixture in place or;
  - 4. By other methods and devices designed and intended for use as lighting fixture support, or;
  - 5. As shown on the drawings.
  - 6. All lighting fixtures installed in grid type suspended ceiling systems, shall be positively attached to the ceiling system with clips that are UL listed for the application. In addition, a minimum of four (4) ceiling support system rods or wires shall be provided for each light fixture and shall be installed not more than six (6) inches from fixture corners. Provide two (2) No. 9 gage hangers from each fixture housing to the building structure above

(wires may be installed slack). Light fixtures that weigh more than 56 pounds shall be supported directly from the structure above by UL listed and approved hangers. Light fixtures that are smaller than the ceiling grid shall be installed at locations indicated on the reflected ceiling plans, or shall be installed in the center of the ceiling panel and shall be supported independently by at least two metal channels that span and are secured to the ceiling system.

7. Suspended lighting fixtures shall be supported directly from the building structure without using suspended ceilings as support systems. Support systems shall be UL listed and approved for the specific installation. Where pendants or rods exceed 48 inches in length, brace support systems to limit swinging.
- B. The lighting fixture support system detail shall be submitted with and be a part of the lighting fixture shop drawing submittal.
- C. Lighting fixtures shall not be supported from the leg of pre-cast pre-stressed concrete.

END OF SECTION 26 05 01

## **SECTION 26 05 13 – MEDIUM VOLTAGE CABLES**

**NOTE TO CONTRACTOR: ALL PRIMARY CABLING WORK, INCLUDING ALL TERMINATIONS, CONNECTORS AND SPLICES MUST BE FULLY AND COMPLETELY COORDINATED WITH THE OWNER TO ENSURE THAT THE UNDERGROUND PRIMARY DISTRIBUTION SYSTEM IS COMPLETE IN ALL RESPECTS. ALL NEW CABLING AND EQUIPMENT MUST BE FULLY AND COMPLETELY COMPATIBLE WITH EXISTING SYSTEM COMPONENTS.**

### **1. GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to work of this Section.
- B. This Section is a Division 26 "Basic Materials and Methods" section and is part of each Division 26 section making reference to wires and cables specified herein.

#### **1.2 DESCRIPTION OF WORK**

- A. Types of medium voltage conductors, cables and connectors include the following:
  - 1. Medium Voltage Copper Conductors
  - 2. Medium Voltage Splices
  - 3. Medium Voltage Terminators

#### **1.3 REFERENCES**

- A. NEC Compliance: Comply with NEC as applicable to construction and installation of high voltage wire and cable, terminators and splices.
- B. UL Compliance: Comply with UL standards pertaining to high voltage wire and cable, terminators and splices.
- C. UL Labels: Provide high voltage wire and cable, terminators and splices that have been UL-listed and labeled.
- D. NEMA/ICEA Compliance: Comply with applicable portions of NEMA/Insulated Cable Engineers Association standards pertaining to materials, construction and testing high voltage wire and cable.
- E. ANSI/ASTM: Comply with applicable portions of ANSI/ASTM Standards pertaining to construction of high voltage cables.
- F. IEEE Compliance: Comply with applicable portions of IEEE standards pertaining to high voltage wire and cable, terminators and splices.

#### **1.4 SUBMITTALS**

- A. Product Data: Submit manufacturer's data on electrical high voltage wire and cable, terminators and splices.

## 2. PRODUCTS

### 2.1 MANUFACTURERS – WIRE AND CABLE

A. Subject to compliance with requirements, provide the following:

1. Okonite
2. Rome
3. Pirelli
4. 3M, Elastimold, or Cooper Power (Medium Voltage Cable Terminations)

### 2.2 MANUFACTURERS – CONNECTORS

A. Subject to compliance with requirements, provide one of the following:

1. AMP
2. 3M Company
3. Elastimold

### 2.3 15KV CONDUCTORS

- A. Medium voltage conductors (15kV) shall be stranded copper in accordance with ASTM Spec B-3. Conductors shall be class B concentric stranded in accordance with ASTM Specifications B-8.
- B. The stranded conductors shall be shielded with an extruded conductor shield consisting of a semi-conducting layer before insulation. The insulation shall be ethylene propylene rubber. The insulation thickness shall be a nominal .220 inches minimum, and shall have a tensile strength of 2000 psi minimum. With an AC voltage test of 100 volts per mil of insulation thickness, the cable shall have an insulation resistance value of not less than that corresponding to a constant of 50,000 at 15.6 degree C. Cable shall withstand a DC voltage test of 300 volts per mil of insulation thickness and a corona level of not less than 110% of the maximum rated circuit voltage to ground. The dielectric constant of insulation at room temperature shall not exceed 2.75. All high voltage wire shall be rated 15 kV (133%) ungrounded neutral; however, it will be used with a grounded neutral. All tests shall be performed in accordance with ICEA requirements. Over the insulation shall be an extruded semi-conducting screen and a 5 mil tape shielding which shall consist of a non-magnetic, coated copper tape applied with a lap. All cable shall be provided with a jacket consisting of a polyvinylchloride compound conforming to the requirements of ICEA. Jacket thickness shall be minimum .080 inches. Any conductor with a void in outer jacket will not be acceptable and shall not be installed.
- C. The neutral wire and grounding conductor, where shown installed with high voltage conductors, shall be copper and shall have Type THWN 600 V insulation.
- D. Minimum bending radius of the 15kV cable shall be fifteen times the diameter of the cable. This cable shall be installed with an approved non-harmful lubricant. Cable pulling tension shall not exceed manufacturer's recommendation, and in no case be larger than .008 lbs per circular mil area of copper cross section. All cable shall be installed in accordance with ICEA recommendations.
- E. Conductors shall be "looped" in all manholes and all termination manholes prior to termination. Looping shall completely encircle manhole at perimeter. Tie to insulated racks with nylon Ty-Raps.

- F. Conductors shall be Okonite Okoguard, or approved equivalent as manufactured by Southwire, Pirelli or Rome.

2.4 After 15kV cable is installed and tested, all raceways shall be sealed with Dux-Seal

## 2.5 MEDIUM VOLTAGE CABLE TERMINATIONS

- A. Contractor shall provide terminations on all medium voltage (15KV) cables. Splices will not be permitted on new conductors. If necessary on existing conductors, all splices shall be with permission of the engineer, in writing, and shall not be detrimental to the system. Verify terminations at all pad-mounted transformers and sectionalizing switches, and provide compatible components.
- B. Termination of medium voltage cable at sectionalizing switches shall be by 3M – QT-III Series, Outdoor, with skirted insulation configuration. Terminations shall meet all requirements for Class I termination as per IEEE Standard 48-1975. Install as per the manufacturers instructions. Termination pins shall be installed on each cable conductor prior to termination. Care shall be exercised in all soldering to prevent over-heating and damage to conductors. Terminations shall be provided with all necessary accessories.
- C. Terminations at all pad mounted transformers shall be Elastimold 165LR, 15KV, 200 amp loadbreak elbow connector, compatible with loadbreak bushing insert on transformer. Connector shall be crimp type for cable furnished, applied with proper tool. Plug inserts and bail wire assembly shall be provided for each termination. Equivalent elbows by Cooper Power are acceptable.
- D. Supply and install elbow type surge arrestors on unused primary loop bushings on the transformer. Arrestors shall be 8.4 KV (MCOV) rated by Elastimold or Cooper Power. Install as per manufacturers instructions.
- E. Prepare cable in accordance with manufacturer's recommendations. Cable insulation shall be penciled with approved tools and cleaned with solvent. Penciling of insulation shall be such that insulation is clean, smooth and free from knife marks.
- F. Shielding shall be grounded at terminations with flexible woven strip conductor. On splices, ground shall be continuous between shield of each cable and braid spiraled around splice under cover tape.

## 3. EXECUTION

- 3.1 General: Install high voltage wire and cable, splices and terminations as indicated in compliance with manufacturer's written instructions, applicable requirements of NEC and NECA's "Standard of Installation" and in accordance with recognized industry practices.
- 3.2 Coordinate cable and wire installation work with electrical raceway and equipment installation work, as necessary for proper interface.
- 3.3 Use pulling compound or lubricant where necessary; compound must not deteriorate conductor or insulation.
- 3.4 Cable Identification: All cables shall be identified as to Phase A, B, or C at all termination points, manholes, switchgear, sectionalizers, and in locations where the cable is accessible. All exposed conduit within buildings shall be provided with a ("2,400", 4,160 or "12,470") volt danger" marker on 50 ft. centers.

- 3.5 Phase Connections: The Contractor shall take proper steps to determine the proper phase connections for all 15KV connections, splices and terminations are made and all existing downstream equipment phase rotations are maintained.
- 3.6 Conductor Arcproofing in Manholes
- A. Cover power feeder cables in manholes with arcproof and flameproof tape.
  - B. Provide 3M Company "Scotch" No. 77 tape or approved equal, to provide an installation capable of withstanding a 200-amp arc for not less than 30 seconds.
  - C. Apply tape in a single layer, one-half lapped, or as recommended by the manufacturer to conform to the above requirements. Apply with the coated side next to the cable and hold in place with a random wrap of 1/2 inch wide, pressure-sensitive, glass cloth electrical tape, 3M Company "Scotch" No. 69. Tape to be color coded as specified previously.
- 3.7 Cable Test: Each section of cable shall be HI-POTTED after it has been pulled into the duct and the splice or termination has been prepared but before the shrink tubing has been installed. Cable shall be HI-POTTED to 60kV for a minimum of 15 minutes. All results shall be recorded on a suitable test form and submitted to the Architect and Owner in a shop drawing transmittal. Test method shall be as follows:
- A. Apply voltage in approximately 8 to 10 equal steps.
  - B. Raise the voltage slowly between steps.
  - C. At the end of each step, allow the charging currents to decay, and time the interval of decay.
  - D. Read the leakage current and plot a curve of leakage current versus test voltage on graph paper as the test progresses. Read the leakage current at the same time interval for each voltage step.
  - E. Stop the test if leakage currents increase excessively or a "knee" appears in the curve before maximum test voltage is reached. For new cable, repair or repair or replace the cable and repeat the test.
  - F. Upon reaching the maximum test voltage, hold the voltage for 5 minutes. Read the leakage current at 30 second intervals and plot a curve of leakage current versus time on the same graph paper as the step voltage curve. Stop the test if leakage current starts to rise, or decreases and again starts to rise. Leakage current should decrease and stabilize for good cable.
  - G. Terminate the test and allow sufficient discharge time before testing the next conductor.
  - H. Exercise suitable and adequate safety measures prior to, during and after the high potential tests, including placing warning signs and preventing people and equipment from being exposed to the test voltages.

END OF SECTION 26 05 13



## **SECTION 26 05 19 - CONDUCTORS**

### **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 work in this Section.
- B. This Section is a Division 26 "Basic Materials and Methods" section, and is part of each Division 26 section making reference to conductors.

#### **1.2 Description of Work:** Extent of electrical wire and electrical cable work is indicated by drawings and schedules. Types of wire, cable and connectors in this Section include the following:

- A. Conductors
- B. Power-limited circuit cable
- C. Service entrance cable

#### **1.3 QUALITY ASSURANCE**

- A. Manufacturers: Firms regularly engaged in the manufacture of electric wire and cable products of types and ratings required, whose products have been in satisfactory use in similar service for not less than 5 years.
- B. Installer: Qualified with at least 3 years of successful installation experience on projects with electrical wiring work similar to that required for this project.

#### **1.4 REFERENCES**

- A. NEC Compliance: Comply with NEC as applicable to construction and installation of electrical wire, cable and connectors.
- B. UL Compliance: Comply with UL standards pertaining to wire cable and connectors.
- C. UL Labels: Provide electrical wires, cables and connectors which have been UL-listed and labeled.
- D. NEMA/ICEA Compliance: Comply with applicable portions of NEMA/Insulated Cable Engineers Association Standards pertaining to materials, construction and testing of wire and cable.
- E. ANSI/ASTM: Comply with applicable portions of ANSI/ASTM standards pertaining to construction of wire and cable.
- F. IEEE Compliance: Comply with applicable portions of IEEE standards pertaining to wire and cable.

- G. NECA Compliance: Comply with NECA's "Standard of Installation."

## 1.5 SUBMITTALS

- A. Submit manufacturer's data on electric wire and cable.

## 2. PRODUCTS

- 2.1 Manufacturers: Subject to compliance with requirements, provide products of one of the following (for each type of wire, cable and connector):

- A. WIRE AND CABLE:

1. Advance Wire and Cable, Inc.
2. Cerro Wire and Cable, Co.
3. Electrical Conductors, Inc.
4. General Cable Corp.
5. Hitemp Wires, Inc.
6. Rome Cable Corp.
7. Southwire Company
8. The Okonite Company
9. Encore Wire

- B. CONNECTORS:

1. Amp, Inc.
2. Burndy Corp.
3. Eagle Electric Mfg. Co., Inc.
4. Gould, Inc.
5. Ideal Industries, Inc.
6. Joselyn Mfg. and Supply Co.
7. O-Z/Gedney Co.
8. Pyle National Co.
9. Thomas and Betts Co.

## 2.2 WIRE, CABLE, AND CONNECTORS

- A. General: Except as otherwise indicated, provide wire, cable and connectors of manufacturer's standard materials, as indicated by published product information; designed and constructed as recommended by manufacturer, and as required for the installation.

- B. WIRE:

1. All conductors shall be 600-volt and shall be copper, soft drawn, annealed, having a conductivity of not less than 98% pure copper with dual rated type THHN/THWN insulation unless otherwise specified or indicated on the drawings.
2. No wire shall be smaller than No. 12 AWG, except wiring for signal and pilot control circuits, and pre-manufactured fixture whips for light fixtures.
3. All wire No. 12 AWG shall be solid unless otherwise indicated within these specifications. All wire No. 10 AWG and larger shall be stranded.
4. All wiring installed in light poles or other areas subject to vibration shall be stranded.

5. Wire sizes shown are minimum based on code requirements, voltage drop and/or other considerations. Larger sizes may be installed at the Contractor's option to utilize stock size, provided conduit sizes are increased where necessary to conform to the National Electrical Code. Sizes of wires and cables indicated or specified are American Wire Gage (Brown and Sharpe).
6. All feeder and branch circuit wiring shall be color-coded as follows:

| <u>PHASE</u> | <u>120/208 VOLT</u> | <u>277/480 VOLT</u> |
|--------------|---------------------|---------------------|
| A            | Black               | Brown               |
| B            | Red                 | Orange              |
| C            | Blue                | Purple              |
| Neutral      | *White              | *White              |
| Ground       | Green               | Green               |

\*Except as provided in paragraph 200.6 of the NEC.

#### C. ALUMINUM WIRE:

1. Aluminum conductors shall not be substituted for copper conductors.

#### D. CONNECTIONS

1. Wire connections shall be as follows unless otherwise indicated on the drawings.
  - a. Use preinsulated connectors 3M Company "Scotchlok," or Ideal Industries, Inc. "super nut," for splices and taps in conductors No. 10 AWG and smaller. All other twist-on connectors must be reviewed by the Architect prior to installation. Use this type of connector for factory-made splices in fixtures or equipment.
  - b. Pressure indent type connectors must be submitted to the Architect for review.
  - c. Tape all splices and joints with vinyl plastic tape manufactured by Minnesota Mining and Manufacturing Company. Use sufficient tape to secure insulation strength equal to that of the conductors joined.
  - d. Keep splices in underground junction boxes to an absolute minimum. Where splices are necessary, use resin pressure splices and resin splicing kits manufactured by the 3M Company, St. Paul, Minnesota, to totally encapsulate the splice. Arrange the splicing kit to minimize the effects of moisture.
  - e. Connect wire No. 6 AWG and larger to panels and apparatus by means of approved lugs or connectors.
  - f. Connect wire No. 10 AWG and larger to panels, motors and electrical apparatus using OZ (or equivalent) type XL set screw type lugs. Lugs shall accommodate full wire capacity for stranded conductors. All connections and connectors shall be solderless.
  - g. Connectors of the porcelain cup type with or without metal inserts shall not be used, including all splices in fixtures which are made in advance by the fixture manufacturer. Splices in wire No. 8 AWG and larger shall be made with approved solderless lugs. If any type of pressure indent type connector is proposed for use on any size conductor, it shall be specifically submitted for approval prior to use.

### 3. EXECUTION

#### 3.1 INSTALLATION

- A. General: Install electric cables, wires and connectors as indicated in compliance with manufacturer's written instructions, applicable requirements of the NEC and NECA's "Standard of Installation", and in accordance with recognized industry practices.
- B. Coordinate cable and wire installation work with electrical raceway and equipment installation work, as necessary for proper interface.
- C. Conductors shall be continuous from outlet to outlet and no splices shall be made except within outlet or junction boxes. Junction boxes may be utilized wherever required.
- D. Splicing: No splicing or joints will be permitted in either feeder or branch circuits except at outlet or accessible junction boxes.
- E. Wire shall not be installed in raceways until the concrete work and plastering is completed and all conduits in which moisture has collected have been swabbed out. Insulation resistance to ground shall not be less than that approved by NEC. Eliminate splices wherever possible.
- F. Use pulling compound or lubricant where necessary. Compound must not deteriorate conductor insulation.
- G. Prior to energization, check cable and wire for continuity of circuitry, and for short circuits. Correct malfunctions when detected.
- H. Bury a continuous, pre-printed, bright colored plastic ribbon cable marker with each underground cable, regardless of whether conductors are in conduit. Locate each directly over cables 12" below finished grade.
- I. Conductor Installation: Install all conductors in a single raceway at one time, insuring that conductors do not cross one another while being pulled into raceway. Leave sufficient cable at all fittings or boxes and prevent conductor kinks. Keep all conductors within the allowable tension and exceeding the minimum bending radius.
- J. Conductor Support: Provide conductor supports as required by the code and recommended by the cable manufacturer. Where required, provide cable supports in vertical conduits similar to OZ Type C.M.T., and provide the lower end of conduit with OZ Type KVF ventilators.
- K. Conductor Termination: Provide all power and control conductors, that terminate on equipment or terminal strips, with solderless lugs or fork and flanged tongue terminals. Provide T and B "sta-kon" tongue terminal. This type conductor termination is not required when the equipment is provided with solderless connectors.
- L. **Many circuits are shown on the drawings to be provided with dedicated neutral and ground conductors. Carefully review circuiting and the electrical abbreviations and symbols legend and provide the number of conductors indicated.**
- M. **Unless otherwise indicated provide dedicated neutral conductors for all branch circuits. Neutral conductors shall not be shared between circuits. Where the drawings indicate shared neutral conductors, for a multi-wire branch circuit, group the breakers together in accordance with NEC requirements.**

### 3.2 CONDUCTOR ARCPROOFING

- A. Cover two or more power feeder cables occurring in the same switchboard section, junction box or pull box (including pull boxes over switchboards) with arcproof and flameproof tape.
- B. Provide 3M Company "Scotch" No. 77 tape or Plymouth Rubber Co. Slipknot No. 30 tape, to provide an installation capable of withstanding a 200-amp arc for not less than 30 seconds.
- C. Apply tape in a single layer, one-half lapped, or as recommended by the manufacturer to conform to the above requirements. Apply with the coated side next to the cable and hold in place with a random wrap of 1/2 inch wide, pressure-sensitive, glass cloth electrical tape, 3M Company "Scotch" No. 69. Tape to be color coded as specified previously.

END OF SECTION 26 05 19

## **SECTION 26 05 26 - GROUNDING SYSTEM**

### **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 work of this Section.
- B. Division 26 "Basic Materials and Methods" sections apply to work of this Section.

#### **1.2 DESCRIPTION OF WORK**

- A. Extent of grounding work is indicated by the drawings and is specified herein.
- B. Applications of grounding work in this Section include the following:
  - 1. Underground Metal Piping
  - 2. Underground Metal Water Piping
  - 3. Metal Building Frames
  - 4. Ground Rods
  - 5. Separately Derived Systems
  - 6. Service Equipment
  - 7. Enclosures
  - 8. Equipment
- C. Requirements of this Section apply to electrical grounding work specified elsewhere in these specifications.

#### **1.3 QUALITY ASSURANCE**

- A. Manufacturers: Firms regularly engaged in manufacture of electrical connectors, terminals and fittings, of types and ratings required, and ancillary grounding materials, including stranded cable, copper braid and bus, ground rods and plate electrodes, whose products have been of satisfactory use in similar service for not less than three years.
- B. Installer: Qualified with at least three (3) years experience on projects with electrical grounding work similar to that required for this project.

#### **1.4 REFERENCES**

- A. NEC Compliance: Comply with NEC requirements as applicable to materials and installation of electrical grounding systems, associated equipment and wiring. Provide grounding products which are UL listed and labeled.
- B. UL Compliance: Comply with applicable requirements of UL Standard Nos. 467 and 869 pertaining to electrical grounding and bonding.
- C. IEEE Compliance: Comply with applicable requirements of IEEE Standard 142 and 241 pertaining to electrical grounding.

- D. Utility: Grounding shall be done so as to comply with all applicable grounding requirements and rules of the serving utility.
- E. NECA Compliance: Comply with NECA's "Standard of Installation."

## 1.5 SUBMITTALS

- A. Product Data: Submit manufacturers data on grounding systems and accessories.
- B. Shop Drawings: Submit layout drawings of grounding systems and accessories including, but not limited to, ground wiring, copper braid and bus, and ground rods.

## 2. PRODUCTS

### 2.1 Acceptable Manufacturers: Subject to compliance with the requirements, provide grounding products of one of the following:

- A. B-Line Systems
- B. Burndy Corporation
- C. Crouse Hinds
- D. Electrical Components Div.; Gould Inc.
- E. General Electric Supply Co.
- F. Ideal Industries, Inc.
- G. Thomas and Betts Corp.
- H. Western Electric Co.

### 2.2 Grounding Systems: Except as otherwise indicated, provide electrical grounding systems indicated; with assembly of materials, including but not limited to cables/wires, connectors, terminals, ground rods/electrodes, bonding jumper braid, and additional accessories needed for a complete installation. Where more than one type unit meets indicated requirements, selection is installer's option. Where materials or components are not indicated, provide products complying with NEC, UL, IEEE and established industry standards for applications indicated.

### 2.3 Conductors: Unless otherwise indicated, provide electrical grounding conductors for grounding connections matching power supply wiring materials and sized according to NEC requirements.

### 2.4 Bonding Jumper Braid: Provide copper braid tape, constructed of 30 gage bare copper wires and properly sized for indicated applications.

### 2.5 Flexible Jumper Strap: Provide flexible flat conductor, 480 strands of 30 gage bare copper wire; 3/4" wide, 9-1/2" long; 48,250 cmil. Protect braid with copper bolt hole ends with hole sized for 3/8" dia. bolts.

- 2.6 Bonding Plates, Connectors, Terminals and Clamps: Provide electrical bonding plates, connectors, terminals, lugs and clamps as recommended by bonding plate, connector, terminal and clamp manufacturers for indicated applications.
- 2.7 Ground Rods: Provide steel ground rods with copper welded exterior, 3/4" dia. x 10'.
- 2.8 Electrical Grounding Connection Accessories: Provide electrical insulating tape, heat-shrinkable insulating tubing, welding materials, and bonding straps as recommended by accessories manufacturers for types of service indicated.

### **3. EXECUTION**

#### **3.1 GENERAL**

- A. Inspection: Installer must examine areas and conditions under which electrical grounding connections are to be made and notify the Architect/Engineer in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the installer.
- B. General: Install electrical ground systems where shown, in accordance with applicable portions of the NEC, with NECA's "Standard of Installation", and in accordance with recognized industry practices to ensure that products comply with requirements and serve intended functions.
- C. Coordinate with other electrical work as necessary to interface installation of electrical grounding systems with other work.
- D. Grounding and bonding of electrical installations and specific requirements for systems, circuits and equipment required to be grounded shall be accomplished for temporary and permanent construction.
- E. Provide a separate green equipment ground conductor in all electrical raceways to effectively ground all fixtures, panels, receptacles, controls, motors, disconnect switches, exterior lighting standards and noncurrent carrying metal enclosures. The ground wires shall be connected to the building system ground. NEC Table 250-95 shall be used to size the ground conductor if the size is not shown on the drawings.
- F. To satisfy the "effective grounding" requirements of the NEC the path to ground from circuits, equipment, and conductor enclosures shall be permanent and continuous and shall have ample carrying capacity to conduct safely any currents liable to be imposed on it, and shall have impedance sufficiently low to limit the potential above ground and to facilitate the operation of the overcurrent devices in the circuit.
- G. Ground the service in accordance with provisions of the National Electrical Code and the contract drawings.
- H. In addition to the requirements for service entrance grounding listed above, provide a supplemental grounding electrode consisting of driven ground rods (three 10 foot x 3/4 inch copper-clad steel ground rods).
- I. Clean the contact surfaces of all ground connections.



- J. Where separately derived systems occur, ground the system to a grounding electrode acceptable to the code.
- K. Install metallic raceways mechanically and electrically secure at all joints and at all boxes, cabinets, fittings and equipment. At the point of electrical service entrance, bond all metallic raceways together, with a ground conductor, and connect to the system ground bus. Bond all boxes as specified for equipment.
- L. Receptacles: Permanently connect the ground terminal on each receptacle to the green ground conductor.
- M. Motors: Connect the ground conductor to the conduit with an approved grounding bushing, and to the metal frame with a bolted, solderless lug.

END OF SECTION 26 05 26

## **SECTION 26 05 33 - RACEWAYS**

### **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 work of this Section.
- B. This Section is a Division 26 "Basic Materials and Methods" section, and is part of each Division 26 section making reference to electrical raceways specified herein.

#### **1.2 DESCRIPTION OF WORK**

- A. Extent of raceways is indicated by drawings and schedules.
- B. Types of raceways in this Section include the following:
  - 1. Electrical metallic tubing.
  - 2. Flexible metal conduit.
  - 3. Intermediate metal conduit.
  - 4. Liquid-tight flexible metal conduit.
  - 5. Rigid metal conduit.
  - 6. Rigid nonmetallic conduit.
  - 7. Surface metal raceways.

#### **1.3 REFERENCES**

- A. NEMA Compliance: Comply with applicable requirements of NEMA standards pertaining to raceways.
- B. UL Compliance and Labeling: Comply with provisions of UL safety standards pertaining to electrical raceway systems; and provide products and components which have been UL-listed and labeled. Each length of raceway shall bear the Underwriters Laboratories label.
- C. NEC Compliance: Comply with NEC requirements which are applicable to the construction and installation of raceway systems.
- D. NECA Compliance: Comply with NECA's "Standard of Installation".

#### **1.4 SUBMITTALS**

- A. Product Data: Submit manufacturer's data including specifications, installation instructions and general recommendations, for each type of raceway required.

### **2. PRODUCTS**

#### **2.1 STEEL CONDUIT**

- A. Steel Conduit: Rigid steel conduit, intermediate metal conduit and steel electrical metallic tubing shall be hot-dipped, galvanized or sheradized as manufactured by Youngstown Sheet and Tube Company, National Electric, General Electric, or equal.
- B. Joints: Raintight non-insulated throat type compression fittings (connectors and couplings) shall be provided for electrical metallic tubing systems. All fittings shall be of the steel type with steel locknuts equal to Appleton 95 Series.
- C. Expansion Joints: Provide expansion fittings, O.Z. Type AX with bonding jumper for rigid conduit and O.Z. Type TX with bonding jumper for electrical metallic tubing. Where embedded raceways cross building expansion joints, provide combination deflection/expansion fittings, O.Z. Type AXDX, or equal.

## 2.2 RIGID NON-METALLIC (PVC) CONDUIT

- A. PVC (polyvinyl chloride) Conduit: Heavy wall rigid PVC conduit shall be composed of high impact PVC and shall conform to industry NEMA Standards and to Federal Specification WC-1094. Conduits shall be Carlon Schedule 40 type, or approved equal.

## 2.3 FLEXIBLE METAL CONDUIT

- A. Flexible metal conduit shall conform to UL1. It shall be formed from continuous length of spirally-wound, interlocked zinc-coated strip steel.
- B. **Pre-wired armored cabling, types AC or MC are not allowed.**

## 2.4 LIQUID-TIGHT, FLEXIBLE METAL CONDUIT

- A. Liquid-tight flexible metal conduit shall be constructed of a single strip, flexible, continuous, interlocked, and double-wrapped steel; galvanized inside and outside; and coated with an oil-resistant, liquid-tight thermoplastic jacket.

## 2.5 WIREWAYS

- A. General: Provide electrical wireways of types, grades, sizes, weights (wall thicknesses), and number of channels for each type service indicated. Provide complete assembly of wireways including, but not necessarily limited to couplings, offsets, elbows, expansion joints, adapters, hold down straps, end caps, and other components and accessories as needed for a complete system. Where types and grades are not indicated, provide proper selection as determined by the Installer to fulfill wiring requirements and comply with applicable provisions of NEC for electrical raceways.
- B. Surface Metal Raceways: Provide surface metal raceways of sizes and channels indicated; in compliance with FS W-C-582. Construct of galvanized steel with snap-on covers, with 1/8" mounting screw knockouts in base approximately 8" o.c. Provide fittings indicated which match and mate with raceway. Finish with manufacturer's standard prime coating suitable for painting. Provide all necessary devices as shown on the drawings for a complete installation.
- C. Manufacturers: Subject to compliance with requirements, provide surface metal raceways of one of the following:

1. B-Line Systems, Inc.

2. Midland-Ross Corporation
3. Power-Strut Division; Youngstown Sheet and Tube Company
4. Square D Company
5. Versa-Tech Corporation
6. Walker/Parkersburg Division; Textron, Inc.
7. Wiremold Company

### 3. EXECUTION

#### 3.1 GENERAL

- A. Install electric raceways where indicated; in accordance with manufacturer's written instructions, applicable requirements of the NEC and NECA's "Standard of Installation" and complying with recognized industry practices.
- B. Raceways embedded in concrete or in earth below floor slabs shall be rigid steel conduit, intermediate metal conduit or rigid schedule 40 PVC conduit. Rigid PVC conduit shall be provided with rigid metal or intermediate metal conduit elbows when the raceway system exits the concrete topping or earth.
- C. Electrical metallic tubing shall not be embedded in concrete or installed in earth.
- D. Rigid heavy wall Schedule 40 PVC conduit shall be installed in earth and concrete only.
- E. Raceways in outside walls (excluding building perimeter) or in refrigerated areas shall be rigid steel conduit, or intermediate metal conduit.
- F. Provide rigid steel conduit or intermediate metal conduit for exposed raceways from floor to eight feet above the floor in mechanical rooms and in areas designated on the plans.
- G. Rigid galvanized steel conduit or galvanized intermediate metal conduit shall be used where conduit is exposed to weather.
- H. Conduits in hazardous locations shall conform to the National Electrical Code. Rigid galvanized steel conduit or intermediate metal conduit shall be used in hazardous locations. PVC conduit shall not be used in hazardous areas.
- I. Rigid metal, intermediate metal, electric metallic tubing or PVC conduit where allowed in other section 3.1 paragraphs shall be used for feeders and branch circuits.
- J. Flexible metal conduit may be used to connect light fixtures in accordance with NEC requirements but must be limited to a maximum of 6'-0" in length. "Daisy chaining" from fixture to fixture is not permitted. Provide flexible metal conduit for connections to motors, transformers, generators, and other equipment subject to vibration. Length of flexible conduit shall be a minimum of one foot for conduit diameters up to 1-1/2". A minimum of 3" of flexible conduit shall be added for every 1/2" increase in conduit diameter. Flexible metal conduit installation shall be kept to a minimum in connecting other electrical equipment items. Sealtight, flexible conduit shall be used where the flexible conduit may be subject to moist or humid atmosphere, corrosive atmosphere, subject to water spray and subject to dripping oil, grease or water. **Flexible metal conduits shall not be permitted for any other applications, unless specifically approved by the Owner**

- K. Conduits shall be 3/4" diameter, minimum. Raceway sizes shown on the drawing are based on type THHN/THWN conductors.
- L. Type Material: Except as noted otherwise all conduit shall be steel.

### 3.2 INSTALLATION

- A. All raceways shall be installed concealed except where shown or noted otherwise.
- B. At the Owner's option, concealed raceways may be embedded in concrete or routed below the slab. At the Contractor's option, concealed raceways may be installed in furred spaces above ceilings or behind walls.
- C. Continuity: Provide metallic raceways continuous from outlet to outlet, and from outlets to cabinets, junction or pull boxes. Enter and secure conduit to all boxes to provide electrical continuity from the point of service to outlets. Provide double locknut and bushing on terminals of metallic conduits.
- D. A nylon or polypropylene pull string shall be installed in all empty conduits to facilitate future installation of cabling.
- E. Provide accessible "seal-off" fittings for all raceways entering or leaving the hazardous areas, entering or leaving refrigerated areas and as otherwise required by the National Electrical Code.
- F. Where conduits penetrate the roof seal, they shall be installed in curbs provided for mechanical equipment. When this is not possible, suitable pitch pockets, lead flashing, or approved fittings shall be provided. Details for special conduit installations shall be as shown on the drawings.
- G. Reinforced Concrete: No reinforcing steel shall be displaced to accommodate the installation of raceways and outlet boxes. Outlet boxes shall not be installed in beams or joists. In general, all embedded conduits shall be located in the physical center of the particular section of concrete. Unless otherwise indicated, raceways embedded in reinforced concrete shall conform to the following usual types of conditions. Particular attention is called to the fact that there are many extenuating conditions where the Contractor may be instructed in writing during the course of the project not to place embedded conduits in certain areas, generally due to the possibility of unsightly cracking or for structural reasons. This instruction shall not entitle the Contractor to extra compensation. Any condition not covered by the following usual conditions shall require special clarification.

#### Location

#### Maximum Allowance

- |                                  |  |
|----------------------------------|--|
| 1. Columns                       | Displacement of 4 percent of plan area of column.  |
| 2. Floors and Walls              | Displacement of 1/3 of thickness of concrete spaced not less than three diameters on center. |
| 3. Beams and Joists              | Displacement of 1/3 of least dimension, spaced not less than three diameters on center.      |
| 4. Sleeves thru Floors and Walls | 2" maximum pipe size, not less than three diameters on center.                               |

- H. Plain Concrete: Raceways shall not be placed in plain concrete, such as cement toppings on structural floors without special instructions.

- I. Furred Spaces: Raceways installed in furred spaces shall be installed in accordance with the requirements of the National Electrical Code. Do not anchor or strap conduits to the ceiling furring channels or attach to furred ceiling hanger wires. Raceways may be attached to the suspension system (wire hangers) of drop ceilings if installed in such a manner that the ceiling panels may be removed without interference with the raceway, and the wire hangers are sized to carry the additional raceway load.
- J. Stub Ups: Extend conduit stubs at least one foot above slab or fill, before connection is made to electrical metallic tubing.
- K. Exterior Conduits: Install raceways a minimum of 42" below finished grade unless noted otherwise on the drawings.
- L. Provide marking of conduit and junction boxes to indicate which distribution system they are serving. The markings could be colored tape on conduit at or near junction boxes with different colored tapes indicating different distribution systems. Concealed junction boxes shall be legibly marked with a magic marker to indicate the panel and circuit number that junction box serves.
  - 1. The distribution systems shall be color coded as follows:
    - a. 120/208 Volt - Green
    - b. 277/480 Volt - Orange
- M. Steel Conduit (galvanized rigid steel, IMC or EMT):
  - 1. Cutting: Cutting shall be done with hand or power hacksaws. All cut ends shall be reamed to remove burrs and sharp edges.
  - 2. All threaded joints shall be made up wrench-tight and all compression joints shall be made up mechanically secure and snug so as to make continuous current-carrying electrical contact.
  - 3. All metallic conduits buried or otherwise in contact with earth shall be painted using one heavy continuous coat of asphalt varnish after assembly of conduit and fittings.
  - 4. Expansion joints shall be installed in steel conduit systems in structures as follows (expansion joints are specified elsewhere in the specification):
    - a. Where conduit run crosses a building expansion joint.
    - b. In any conduit run exceeding 100 feet in length.
    - c. Where shown on the drawings.
- N. Threads: Clean all threads of rigid or intermediate metal conduit. Coat all male threads of all steel conduit installed in concrete with red or white lead immediately before being coupled together.
- O. Running Threads: Use "Erickson" type couplings in lieu of running threads.
- P. PVC Conduit:
  - 1. Joints: Conduits shall be joined by using couplings and solvent cement furnished or recommended by the raceway manufacturer. Finished joints shall be secure and watertight.

2. Cutting: Cutting shall be done with hacksaws and ends shall be reamed to remove burrs and sharp edges.
3. Expansion Joints: Expansion joints shall be installed:
  - a. Where conduit run crosses a building expansion joint.
  - b. As recommended by the manufacturer or as shown on the drawings.
4. Bends for PVC conduit sizes 2" and smaller may be made "hot" in the field. Inside dimension shall be thereby undistorted. For PVC sizes larger than 2", provide only factory bends.

END OF SECTION 26 05 33

## **SECTION 26 36 13 – SERVICE ENTRANCE RATED MANUAL TRANSFER SWITCH**

### **1. GENERAL**

#### **1.01 SCOPE**

- A. Furnish and install manual transfer switches (MTS) with number of poles, amperage, voltage, and withstand current ratings as shown on the plans. Each manual transfer shall consist of a 3 position center off mechanically held power transfer switch unit and a mechanical operating mechanism to provide complete manual operation. All transfer switches and mechanical operating mechanism shall be the product of the same manufacturer.
- B. Furnish an enclosure for the (3MUS) that is for service entrance. It shall provide the proper disconnecting, protection, grounding and bonding required for service entrance equipment.

#### **1.02 ACCEPTABLE MANUFACTURERS**

Service Entrance Manual transfer switches shall be ASCO Series 3MUS. Other approved manufacturers include: Cummins Power Generation, GE, Russ Electric, and Thompson Power System. Any alternate products shall be submitted to the consulting engineer in writing at least 10 days prior to bid. Each alternate bid must list any deviations from this specification.

#### **1.03 CODES AND STANDARDS**

The manual transfer switches and accessories shall conform to the requirements of:

- A. UL 1008 Listed for Optional Standby Transfer Switches (Manual Transfer Switches)
- B. CSA C22.2 No.178 – 1978
- C. IEC 60947-6-1 Low – Voltage Switchgear and Controller
- D. NFPA 70 - National Electrical Code
- E. IEEE Standard 446 - IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications
- F. UL 508 Industrial Control Equipment
- G. NEC Article 700.3 (F)
- H. International Standards Organization ISO 9001: 2008
- I. RoHs compliant (Restriction of Hazardous Substances)
- J. Seismic qualification – International Building Code & OSHPD to SDS level of 2.5

### **2. PRODUCTS**

#### **2.01 MECHANICALLY HELD TRANSFER SWITCH**

- A. The transfer switch unit shall be manually operated and mechanically held. The switch shall be mechanically interlocked to ensure only one of three possible positions, Source 1, Source 2, or Center Off. Fused disconnect type switches shall not be acceptable.



- B. The switch shall be positively locked and unaffected by momentary outages so that contact pressure is maintained at a constant value and temperature rise at the contacts is minimized for maximum reliability and operating life.
- C. All main contacts shall be silver composition. Switches rated 600 amperes and above shall have segmented blow-on construction for high withstand current capability and be protected by separate arcing contacts.
- D. Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors.
- E. Designs utilizing components of molded-case circuit breakers, contactors, or parts thereof which are not intended for continuous duty, repetitive switching or transfer between two active power sources are not acceptable.
- F. Where neutral conductors must be switched, the MTS shall be provided with fully- rated neutral transfer contacts.
- G. The MTS shall be tested in accordance with UL 1008 for transfer switches. Switch ratings of 400 amperes shall have endurance ratings of 4000 cycles. Switch ratings of 600 – 1200 amperes shall have endurance rating of 3000 cycles.

### **3. OPERATION**

#### **3.01 MANUAL OPERATIONS PROVISIONS**

- A. The transfer switch shall be arranged for manually actuated manual operation.
- B. The manual transfer shall be actuated via a mechanical operating mechanism.
- C. The manual operating handle shall be capable of external operation without opening the enclosure door.
- D. It shall have the same contact to contact speed as automatic operation
- E. There shall be three positions for manual operation:
  - 1. Connected to Source 1 (preferred)
  - 2. Connected to Source 2 (alternate)
  - 3. Connected to center off (disconnected position)
- F. Switch position when connected to Source 1, or Source 2 shall be pad -lockable

### **4. OTHER REQUIREMENTS**

#### **4.01 ENCLOSURE**

- A. The 3MUS shall be furnished in a NEMA type 3R secure enclosure unless otherwise shown on the plans.
- B. Enclosures shall be free standing, floor mounted.
- C. Enclosure shall be made of 316 stainless steel.
- D. Provide strip heater with thermostat within enclosure.

#### **4.02 ADDITIONAL FEATURES**

- A. Mechanical position indicators (yellow) visible to the operator shall be included for

Source 1 (preferred), Source 2, (alternate), and Center Off (disconnected).

- B. LED indicators shall be available for Source 1 (preferred), and Source 2 (alternate).
- C. Auxiliary position indicating contacts, rated 10 amps, 250 Vac shall be provided consisting of one closed when the MTS is connected to Source 1 (preferred), and one contact closed when the MTS is connected to Source 2 (alternate)
- D. A form A contact shall be provided to indicate switch is in the Center Off (disconnected) position.
- E. MTS shall be provided with ASCO #170BP accessory package.
- F. Enclosure Heater
  - 1. A 125 watt enclosure heater with transformer and thermostat (adjustable from 30 degrees to 140 degrees F) shall be provided in the outdoor enclosure.
- G. Disconnecting and Overcurrent Protection Device
  - 1. For manual transfer switches less than 1000 amperes, the normal connection shall be provided with a thermal magnetic rated molded case circuit breaker with current ratings as shown on the plans. It shall have a thermal magnetic trip unit.

#### 4.03 WITHSTAND AND CLOSING RATINGS

- A. The MTS shall be rated to close on and withstand the available RMS symmetrical short circuit current at the MTS terminals with the type of overcurrent protection shown on the plans. WCR MTS ratings @ 480v shall be as follows when used with specific circuit breakers or current limiting fuses:

| MTS Size   | Withstand & Closing<br>Rating MCCB | W/CLF   |
|------------|------------------------------------|---------|
| 800 - 1200 | 65,000A                            | 200,000 |

#### 4.04 TESTS AND CERTIFICATION

- A. The complete MTS shall be factory tested to ensure proper operation of the individual components and correct overall sequence of operation and to ensure compliance with the specification requirements.
- B. Upon request, the manufacturer shall provide a notarized letter certifying compliance with all of the requirements of this specification including compliance with the above codes and standards, and withstand and closing ratings. The certification shall identify, by serial number(s), the equipment involved. No exceptions to the specifications, other than those stipulated at the time of the submittal, shall be included in the certification.
- C. The MTS manufacturer shall be certified to ISO 9001: 2008 International Quality

Standard and the manufacturer shall have third party certification verifying quality assurance in design/development, production, installation and servicing in accordance with ISO 9001: 2008.

#### 4.05 WARRANTY & SERVICE

- A. The manual transfer switch shall come with a warranty of no less than 24 months from date of shipment.
- B. The MTS manufacturer shall maintain a national service organization of company-employed personnel located throughout the contiguous United States. The service center's personnel must be factory trained and must be on call 24 hours a day, 365 days a year.
- C. The manufacturer shall maintain records of switch shipments, by serial number, for a minimum of 20 years.
- D. For ease of maintenance, the transfer switch nameplate shall include drawing numbers and serviceable part numbers.

END OF SECTION 26 36 13

## **SECTION 26 51 00- LIGHTING**

### **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 the work of this Section.
- B. Division 26 "Basic Materials and Methods" sections apply to the work in this Section.

#### **1.2 DESCRIPTION OF WORK**

- A. Types of interior and exterior lighting fixtures in this Section include the following:
  - 1. LED

#### **1.3 QUALITY ASSURANCE**

- A. Manufacturers: Firms regularly engaged in the manufacture of interior and exterior light fixtures of types and ratings required, whose products have been in satisfactory use in similar service for not less than three years.
- B. Installer: Qualified with at least three years of successful installation experience on projects with interior and exterior lighting fixture work similar to that required for this project.

#### **1.4 REFERENCES**

- A. NEC Compliance: Comply with the NEC as applicable to the installation and construction of lighting fixtures.
- B. NEMA Compliance: Comply with applicable requirements of NEMA Standard Pub. Nos. LE-1 and LE-2 pertaining to lighting equipment.
- C. ANSI/UL Compliance: Comply with ANSI/UL Standards pertaining to interior and exterior lighting fixtures for hazardous locations.
- D. UL Compliance: Provide light fixtures that have been UL listed and labeled.
- E. NECA Compliance: Comply with NECA's "Standard of Installation".

#### **1.5 SUBMITTALS**

- A. Product Data: Submit manufacturer's product data on lighting fixtures.
- B. SHOP DRAWINGS
  - 1. Furnish shop drawing portfolios (collated bound sets) containing the following information:

- a. Name of manufacturer
  - b. Descriptive cut sheets
  - c. Complete photometric information
  - d. Coefficient of utilization tables
  - e. Fixture voltage
  - f. The number, type and wattage of the fixture lamps
  - g. Lens types
  - h. Fixture options
  - i. Fixture mounting details
  - j. Fixture door types
  - k. Construction of fixture housing and/or door
  - l. Fixture ballast manufacturer and type
2. All lighting fixtures required to be used on this project shall be submitted in one single submittal so that all fixtures can be reviewed at one time. Those fixtures not receiving a shop drawing action of "Reviewed" or "Reviewed and Noted" on the first submittal shall be resubmitted for review. A light fixture receiving a shop drawing action of "Resubmit" or "Rejected" after the third review for any reason, shall be furnished as originally specified.
  3. The portfolios shall be made from standard manufacturer's specification sheets. Each fixture shall be identified by the letter or number indicated on the fixture schedule. The combining of more than one fixture type of fixture on a single sheet shall not be acceptable.

## **2. PRODUCTS**

- 2.1 Manufacturer: Manufacturers of lighting fixtures are noted on the drawings by notes and/or by the light fixture schedule.
- 2.2 Substitutions: If the Contractor proposes to substitute lighting fixtures for those shown on the drawings or specified herein, he shall submit a list of proposed fixtures together with technical data to substantiate that the substitute fixtures are equivalent in all respects to the specified equipment. Proposed substitute fixtures must be submitted to the architect/engineer for review a minimum of ten (10) days prior to the project bid date. Only original documentation will be accepted for review. After review of the proposed substitute fixtures, an addendum or bid bulletin will be issued to include acceptable equipment. The review of substitute equipment in no way relieves the contractor of the responsibility to provide equipment that is equivalent in all respects to specified fixtures. Lighting fixtures as shown on the drawings or specified herein shall be used as a basis and standard of comparison in the review and consideration of fixtures of other manufacturers. The Architect/Engineer shall have the final authority as to whether the fixture is equivalent to the specified item. The proposed substitution may be rejected for the aesthetic value if felt necessary or desirable. In the event the proposed substitutions are rejected, the Contractor shall furnish the specified item.
- 2.3 LED Drivers
  - A. Driver shall operate from 60 Hz input source of 120V through 277V with sustained variations of +/- 10 percent (voltage and frequency).
  - B. Driver input current shall have Total Harmonic Distortion (THD) of less than 20 percent when operated at nominal line voltage.
  - C. Driver shall have a Power Factor greater than 0.90.

- D. Driver shall avoid interference with infrared devices and eliminate visible flicker.
- E. Driver shall comply with ANSI C62.41 Category A for Transient protection.
- F. Driver shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).
- G. The luminaire shall be capable of continuous dimming over a range of 100% to 5% of rated lumen output. Dimming shall be controlled by a 0-10VDC signal.
- H. Control device must be compatible with type of driver, and coordinated prior to submission of shop drawings.
- I. If driver is remote-mounted, provide maximum allowable distances for secondary wire runs to luminaires.
- J. Provide with mounting hardware as required.

## 2.4 LED's

- A. Color temperature specified shall be uniform for all LED modules within like luminaire types. Color temperature measurement shall have a maximum 2 SDCM on the MacAdam Ellipse.
- B. Correlated color temperature as shown in the light fixture schedule. Minimum color rendering index (CRI) of 85.
- C. LED light output and efficacy shall be measured in accordance with IES LM-79 standards.
- D. LED life and lumen maintenance shall be measured in accordance with IES LM-80 standards.
- E. Rated minimum life of 50,000 hours.
- F. The individual LED's shall be connected such that a catastrophic loss or the failure of one LED will not result in a light output loss of the entire luminaire.

## 2.5 PLASTER FRAMES

- A. Standard plaster frames shall be provided for all recessed lighting fixtures installed in plaster or drywall finished walls or ceilings. Coordinate with architectural drawings.

# 3. EXECUTION

## 3.1 INSTALLATION

- A. Install lighting fixtures at locations and heights as indicated, in accordance with fixture manufacturer's written instructions, applicable requirements of the NEC, NECA's "Standard of Installation", NEMA standards, and with recognized industry practices to ensure that lighting fixtures fulfill requirements.

- B. Coordinate with other electrical work as appropriate to properly interface installation of lighting fixtures with other work.
- C. Adjust and Clean: Clean lighting fixtures of dirt and debris upon completion of the installation. Protect installed fixtures from damage during the remainder of the construction period.
- D. Field Quality Control: Upon completion of the installation of lighting fixtures, and after building circuits have been energized, apply electrical energy to demonstrate capability and compliance with the requirements. Where possible, correct malfunctioning units at the site, then retest to demonstrate compliance; otherwise, remove and replace with new units, and proceed with retesting.
- E. Lighting fixture supports: Properly support and install fixtures in strict accordance with all applicable building codes and standards. Fully and completely coordinate the installation of fixtures with actual ceiling systems, and with all building trades. In general, provide fixture supports according to the following (unless applicable codes require more restrictive support details):
  - 1. All lighting fixtures installed in grid type suspended ceiling systems, shall be positively attached to the ceiling system with clips that are UL listed for the application. In addition, a minimum of four (4) ceiling support system rods or wires shall be provided for each light fixture and shall be installed not more than six (6) inches from fixture corners. Provide two (2) No. 12 gage hangers from each fixture housing to the building structure above (wires may be installed slack). Light fixtures that weigh more than 56 pounds shall be supported directly from the structure above by UL listed and approved hangers. Light fixtures that are smaller than the ceiling grid shall be installed at locations indicated on the reflected ceiling plans, or shall be installed in the center of the ceiling panel and shall be supported independently by at least two metal channels that span and are secured to the ceiling system.
  - 2. Suspended lighting fixtures shall be supported directly from the building structure without using suspended ceilings as support systems. Support systems shall be UL listed and approved for the specific installation. Where pendants or rods exceed 48 inches in length, brace support systems to limit swinging.
- F. Square and rectangular fixtures shall be mounted with sides parallel to building and ceiling lines, unless otherwise noted.
- G. Where special fixtures to be used in special ceilings are scheduled, verify all ceiling system details and coordinate fixture type and accessories prior to ordering fixtures. Coordinate and cooperate with ceiling system supplier in the preparation of ceiling system shop drawings.
- H. Install fixtures as recommended by the manufacturer, or as necessary to provide exact horizontal alignment, preventing horizontal or vertical deflection, or angular jointing of fixtures suspended in continuous rows.
- I. Provide concrete bases for pole mounted fixtures as detailed on the drawings and as specified herein.
  - 1. Concrete shall be 3000 psi, minimum.
  - 2. Provide anchor bolts of the size and orientation recommended by the manufacturer. The recommendations of the manufacturer shall govern the installation of all anchor bolts irrespective of any conflicting information.

- J. Where conductors are strung within poles, take all steps necessary to insure that the conductor insulation will not wear by virtue of pole movement caused by wind or similar action. Consult the pole manufacturer for recommendations.
- K. Grounding of Pole Mounted Fixtures: Connect the green ground wire specified in Section 26 05 26, "Grounding System", to the pole ground and luminaire ground.

END OF SECTION 26 51 00



## **SECTION 31 10 00 - SITE CLEARING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. Work shall include all labor, materials, and equipment necessary to completely remove, disconnect and protect the site features as indicated on the plans and as herein specified.
- B. This section includes the following:
  - 1. Protecting existing vegetation to remain.
  - 2. Removing existing vegetation.
  - 3. Clearing and grubbing.
  - 4. Stripping and stockpiling topsoil.
  - 5. Removing above- and below-grade site improvements.
  - 6. Disconnecting, capping or sealing, removing site utilities, and abandoning site utilities in place.
- C. Related Sections:
  - 1. Section 31 25 00 "Erosion and Sedimentation Controls" for erosion and sediment control.

#### **1.3 MATERIAL OWNERSHIP**

- A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

#### **1.4 PROJECT CONDITIONS**

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
  - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
  - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.
  - 1. Do not proceed with work on adjoining property until directed by Architect.

- C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated
- D. Utility Locator Service: Notify One Call for area where Project is located before site clearing.
- E. Do not commence site clearing operations until temporary erosion- and sedimentation-control measures are in place.
- F. The following practices are prohibited within protection zones:
  - 1. Storage of construction materials, debris, or excavated material.
  - 2. Parking vehicles or equipment.
  - 3. Erection of sheds or structures.
  - 4. Impoundment of water.
  - 5. Excavation or other digging unless otherwise indicated.
  - 6. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- G. Do not direct vehicle or equipment exhaust towards protection zones.
- H. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.
- I. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in geotechnical report.
  - 1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Locate and clearly identify trees, shrubs, and other vegetation to remain on site
- C. Protect existing site improvements to remain from damage during construction.
  - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

### 3.2 TREE AND PLANT PROTECTION

- A. General: Protect trees and plants remaining on-site by temp chain link or snow fence.
- B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.
  - 1. Repair or replacement of trees scheduled to remain and damaged by construction operations shall be at Contractor's expense. Cost for tree replacement shall be determined in accordance with the Tree Evaluation Methods as described in The Guide for Plant Appraisal, 1992 Edition by the Council of Tree and Landscape Appraiser

### 3.3 EXISTING UTILITIES

- A. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.
  - 1. Arrange with utility companies to shut off indicated utilities.
- B. Locate, identify, and disconnect utilities indicated to be abandoned in place.
  - 1. Do not proceed with utility interruptions without Owner's written permission.
- C. Excavate for and remove underground utilities indicated to be removed.

### 3.4 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
  - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
  - 2. Grind down stumps and remove roots, obstructions, and debris to a depth of 18 inches below exposed subgrade.
  - 3. Use only hand methods for grubbing within protection zones.
  - 4. Chip removed tree branches and stockpile in areas approved by Architect for use on project site.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

### 3.5 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to depth indicated in geotechnical report in a manner to prevent intermingling with underlying subsoil or other waste materials.
- C. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.
  - 1. Do not stockpile topsoil within protection zones.
  - 2. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity to be reused.

### 3.6 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
  - 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
  - 2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

### 3.7 DISPOSAL OF SURPLUS AND WASTE MATERIALS

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

END OF SECTION 31 10 00

## SECTION 31 20 00 - EARTH MOVING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Preparing subgrades for slabs-on-grade, walks, and pavements.
  - 2. Excavating and backfilling for buildings and structures.
  - 3. Drainage course for concrete slabs-on-grade.
  - 4. Subsurface drainage backfill for walls and trenches.
  - 5. Excavating and backfilling trenches for utilities and pits for buried utility structures.
  - 6. Fine Grading and redistribution of topsoil

#### 1.3 DEFINITIONS

- A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
  - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
  - 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.
- C. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- D. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.
- E. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
  - 1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
  - 2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.
- F. Fill: Soil materials used to raise existing grades.

- G. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.
- H. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
- I. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of the following manufactured products required:
  - 1. Controlled low-strength material, including design mixture.
  - 2. Warning tapes.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Material Test Reports: For each soil material proposed for fill and backfill as follows:
  - 1. Classification according to ASTM D 2487.
  - 2. Laboratory compaction curve according to ASTM D 698.
  - 3. Top Soil Analysis according to ASTM D 442
- C. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

#### 1.6 QUALITY ASSURANCE

- A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.

#### 1.7 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
  - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
- B. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth moving operations.
- C. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures are in place.
- D. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
  2. Parking vehicles or equipment.
  3. Foot traffic.
  4. Erection of sheds or structures.
  5. Impoundment of water.
  6. Excavation or other digging unless otherwise indicated.
  7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- E. Do not direct vehicle or equipment exhaust towards protection zones.
- F. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

## **PART 2 - PRODUCTS**

### **2.1 SOIL MATERIALS**

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: Soil Classification, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
  1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
- E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.
- F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
- G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.
- H. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.
- I. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch sieve and 0 to 5 percent passing a No. 4 sieve.
- J. Sand: ASTM C 33; fine aggregate.

- K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.
  - L. Turf Area Topsoil: New topsoil that is fertile, friable, natural loam, dark in color, free of subsoil, clay lumps, brush, weeds, and other debris; and free of roots, stumps, stones larger than 1/2 inch in any dimension; and free of other extraneous or toxic matter harmful to plant growth. Topsoil should be obtained from local sources. It should have an acidity range (pH) of 5.5 - 7.5, and an organic matter content between 2 and 8 percent. Loam topsoil must have 7 to 30 percent clay, 28 to 60 percent silt, and less than 52 percent sand particles. Not more than 10 percent of topsoil weight can be gravel or stones.
  - M. Planting Bed Topsoil: New topsoil that is fertile, friable, natural loam, dark in color, free of subsoil, clay lumps, brush, weeds, and other debris; and free of roots, stumps, stones larger than one inch in any dimension; and free of other extraneous or toxic matter harmful to plant growth. Topsoil should be obtained from local sources. It should have an acidity range (pH) of 5.5 - 7.5, and an organic matter content between 2 and 8 percent. Loam topsoil must have 7 to 30 percent clay, 28 to 60 percent silt, and less than 52 percent sand particles. Not more than 10 percent of topsoil weight can be gravel or stones.
- 1. Particle Size: Provide topsoil which conforms with the following categories:
    - a. Clay: 0.002 mm and smaller.
    - b. Silt: 0.002 to 0.02 mm.
    - c. Sand: 0.02 to 0.2 mm.
  - 2. Proposed topsoil material shall be inspected and approved by the Architect.

## 2.2 ACCESSORIES

- A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:
  - 1. Red: Electric.
  - 2. Yellow: Gas, oil, steam, and dangerous materials.
  - 3. Orange: Telephone and other communications.
  - 4. Blue: Water systems.
  - 5. Green: Sewer systems.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.
- B. Protect and maintain erosion and sedimentation controls during earth moving operations.
- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.



### 3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
  - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

### 3.3 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
  - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
    - a. 24 inches outside of concrete forms other than at footings.
    - b. 12 inches outside of concrete forms at footings.
    - c. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
    - d. 6 inches beneath bottom of concrete slabs-on-grade.
    - e. 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide.

### 3.4 EXCAVATION FOR WALKS AND PAVEMENTS

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

### 3.5 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
  - 1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.
  - 1. Clearance: As indicated.
- C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. For pipes and conduit less than 6 inches in nominal diameter, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
  2. For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe or conduit circumference. Fill depressions with tamped sand backfill.
  3. For flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support conduit on an undisturbed subgrade.
  4. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.
- D. Trench Bottoms: Excavate trenches 4 inches deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.
1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.
- E. Trenches in Tree- and Plant-Protection Zones:
1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
  2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.

### 3.6 SUBGRADE INSPECTION

- A. Notify Geotechnical Engineer when excavations have reached required subgrade.
- B. If Geotechnical Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
- D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

### 3.7 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

### 3.8 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
  1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
  2. Surveying locations of underground utilities for Record Documents.
  3. Testing and inspecting underground utilities.
  4. Removing concrete formwork.

5. Removing trash and debris.
6. Removing temporary shoring and bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

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

### 3.9 UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.
- B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- C. Backfill voids with satisfactory soil while removing shoring and bracing.
- D. Place and compact initial backfill of subbase material, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.
  1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- E. Place and compact final backfill of satisfactory soil to final subgrade elevation.
- F. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

### 3.10 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place and compact fill material in layers to required elevations as follows:
  1. Under grass and planted areas, use satisfactory soil material.
  2. Under walks and pavements, use satisfactory soil material.
  3. Under steps and ramps, use engineered fill.
  4. Under building slabs, use engineered fill.
  5. Under footings and foundations, use engineered fill.
- C. Place soil fill on subgrades free of mud, frost, snow, or ice.

### 3.11 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
  1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
  2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

### 3.12 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
  - 1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
  - 2. Under concrete pavement, scarify and recompact top 9 inches of existing subgrade and each layer of back fill or fill soil material at 98 percent.
  - 3. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 98 percent.
  - 4. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 95 percent.
  - 5. For utility trenches, compact each layer of initial and final backfill soil material at 95 percent.

### 3.13 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
  - 1. Provide a smooth transition between adjacent existing grades and new grades.
  - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
  - 1. Turf or Unpaved Areas: Plus or minus 1 inch.
  - 2. Walks: Plus or minus 1 inch.
  - 3. Pavements: Plus or minus 1/2 inch.
- C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

### 3.14 SUBSURFACE DRAINAGE

- 1. Compact each filter material layer to 95 percent of maximum dry unit weight according to ASTM D 698.
- B. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches of final subgrade, in compacted layers 6 inches thick. Overlay drainage backfill with one layer of subsurface drainage geotextile, overlapping sides and ends at least 6 inches.
  - 1. Compact each filter material layer to 85 percent of maximum dry unit weight according to ASTM D 698.
  - 2. Place and compact impervious fill over drainage backfill in 6-inch- thick compacted layers to final subgrade.

### 3.15 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

- A. Place subbase course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase course under pavements and walks as follows:
  - 1. Install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
  - 2. Place base course material over subbase course under hot-mix asphalt pavement.
  - 3. Shape subbase course to required crown elevations and cross-slope grades.
  - 4. Place subbase course 6 inches or less in compacted thickness in a single layer.
  - 5. Place subbase course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
  - 6. Compact subbase course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 98 percent of maximum dry unit weight according to ASTM D 698.

### 3.16 FINE GRADING / TOP SOIL PLACEMENT

- A. Prior to fine grading, loosen subgrade soil to a depth of 6".
- B. Cut and fill all areas to elevations and tolerances specified. Leave graded surface clean, free from rubbish and large clods and reasonably smooth. Topsoil shall only be placed during dry weather and when the existing soils are unfrozen.
- C. Remove roots, weeds, rocks over 1", and any foreign material while spreading.
- D. Grade surfaces accurately to elevations indicated on plan to within a tolerance of ½ inch when measured with a 10 foot straightedge and to assure areas drain away from structures and to prevent ponding and pockets. Provide subgrade surfaces free of stones 4 inches in greatest dimension.
  - 1. Provide ½" edge against sidewalks to allow sod to sit flush with pavement edge.
- E. After placement, loosen topsoil by cultivation to a minimum depth of 6 inches throughout entire site. Utilize a Blecavator cultivator, or similar equipment to separate rocks from the soil during the cultivation process, and directing the pulverize soil to the top of the soil profile.
- F. Maintenance: Protect final graded areas from traffic and erosion. Keep free of trash and debris.

### 3.17 FIELD QUALITY CONTROL

- A. Inspections: Contractor will engage a qualified inspector to perform the following inspections:
  - 1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
  - 2. Determine that fill material and maximum lift thickness comply with requirements.
  - 3. Determine, at the required frequency, that in-place density of compacted fill complies with requirements.
- B. Testing Agency: Contractor will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

- C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.
- E. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
  - 1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.
  - 2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 100 feet or less of wall length, but no fewer than two tests.
  - 3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet or less of trench length, but no fewer than two tests.
- F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

### 3.18 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
  - 1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
  - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

### 3.19 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.
- B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.
  - 1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 31 20 00

## **SECTION 31 22 19 – FINISH GRADING**

### **PART 1- GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. Work shall include all labor, materials, and equipment necessary to completely furnish and install the fine grading and soil preparation as indicated on the plans and as herein specified.
- B. Related Sections include the following:
  - 1. Section 31 25 00 "Erosion and Sedimentation Controls" for erosion and sedimentation controls

#### **1.3 QUALITY ASSURANCE**

- A. Subcontract fine grading work to a single firm specializing in fine grading operations. Firm shall have satisfactory record of performance on completed projects of comparable size and quality.

#### **1.4 JOB CONDITIONS**

- A. Proceed with and complete fine grading as rapidly as portions of site become available, working within seasonal limitations.
- B. Protect existing utilities, paving, plant material, and other facilities from damage caused by fine grading operations.
- C. Perform fine grading work only after other work affecting ground surface has been completed.

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

### **3. EXECUTION**

#### **3.1 INSPECTION**

- A. Examine finish surfaces, grades, topsoil quality, and depth. Do not start fine grading work until unsatisfactory conditions are corrected.

#### **3.2 PREPARATION**

- A. Loosen topsoil of planting areas to a minimum depth of 4". Remove stones over 1" in any dimension and sticks, roots, rubbish, and extraneous matter.



- B. Grade planting areas to a smooth, free draining and even surface with a loose, moderately coarse texture. Roll and rake, remove ridges, and fill depressions as required to drain.
- C. Provide straw bale checking in ditches or problem swales at intervals required to effectively slow water velocity.

### 3.3 CLEANUP AND PROTECTION

- A. During fine grading operations, keep pavements clean and work area in an orderly condition.

END OF SECTION 31 22 19

## **SECTION 31 25 00 - EROSION AND SEDIMENTATION CONTROLS**

### **1. GENERAL**

#### **1.1 SUMMARY**

- A. All erosion and sedimentation controls shall be in accordance with 2020 Missouri Standard Specifications for Highway Construction, Section 806.
- B. Refer to Appendix for MoDOT erosion and sedimentation controls specifications.

END OF SECTION 31 25 00

## **SECTION 32 12 16 - ASPHALT PAVING**

### **1. GENERAL**

#### **1.1 SUMMARY**

- A. All asphalt paving shall be in accordance with 2020 Missouri Standard Specifications for Highway Construction. Reference Division 400 for design and construction of BP-1 pavement as shown on the plans.
- B. Refer to Appendix for MoDOT asphalt specifications.

END OF SECTION 32 12 16

## **SECTION 32 13 13 - CONCRETE PAVING**

### **1. GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.
  - 1. All concrete paving shall be in accordance with 2020 Missouri Standard Specifications for Highway Construction.

#### **1.2 SUMMARY**

- A. Work shall include all labor, materials, and equipment necessary to completely furnish and install the Portland Cement Concrete Paving as indicated on the plans and as herein specified.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. See Section 31 20 00 "Earth Moving" for backfilling and subgrade preparation.

#### **1.3 SUBMITTALS**

- A. Pavement marking plan indicating lane separations and defined parking spaces. Note dedicated handicapped spaces with international graphics symbol.

### **2. PRODUCTS**

#### **2.1 PROPORTIONING AND DESIGN OF MIXES**

- A. Design mixes to provide normal weight concrete with the following properties, unless otherwise indicated on drawings and schedules:
- B. Prepare design mix such that ratio of course aggregate to fine aggregate is as specified in section 2.3 subparagraph B. Section 03 30 00 "Cast In Place Concrete for 30% Limestone / 70% Sand and Gravel Aggregate."
  - 1. Parking lots, drives and walks shall have a 28 day F'c = 4000 psi.
- C. Use air-entraining admixture in all exterior concrete.

#### **2.2 SEALANTS**

- A. Foam Expansion Joint Filler: Polyethylene closed-cell expansion-joint filler. Provide Sonoflex F by Sonneborn or equal.
- B. Joint Sealer: Polyurethane self-leveling sealant, ASTM C 920, Type S, Grade P, Class 25, Use T at all expansion and contraction joints.

## 2.3 LANE MARKING PAINT

- A. Lane Marking Paint: Alkyd-resin type, ready-mixed complying with AASHTO M 248, Type "N". Chlorinated-rubber base traffic lane-marking paint, factory-mixed, quick-drying, and nonbleeding may be used at Contractor's option.

- 1. Color: Yellow.

## 3. EXECUTION

### 3.1 SUBBASE PREPARATION

- A. For subbase preparation see Section 31 20 00 "Earth Moving."

### 3.2 CONCRETE

- A. For concrete placement, finishing, curing, surface repairs, and quality control testing during construction see Section 03 30 00 "Cast-In-Place Concrete."

### 3.3 JOINTS

- A. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.
- B. Expansion Joints: If spacing is not indicated, construct expansion joints at 50 foot maximum intervals and at points of contact between slabs and vertical surfaces such as columns, foundation walls, stoops and elsewhere as indicated.
  - 1. Provide foam expansion joint fillers and sealant or traffic grade hot pour at all expansion joints.
- C. Contraction (Control) Joints: Should be cut  $\frac{1}{4}$  of the slab thickness.
  - 1. If joint spacing is not indicated, lay out joints to form square panels. When this is not practical, rectangular panels can be used if the long dimension is no more than 1.25 times the short side. In 4" slabs, the long side should not exceed 10 feet.
    - a. Spacing: Not to exceed 30 x slab thickness or 10 feet, whichever is less.

### 3.4 TRAFFIC AND LANE MARKINGS

- A. Cleaning: Sweep and clean surfaces to eliminate loose material and dust.
- B. Do not apply traffic and lane marking paint until layout and placement have been verified with Architect.
- C. Apply paint with mechanical equipment to produce uniform straight edges. Apply at manufacturer's recommended rates to provide minimum 12 to 15 mils dry thickness.

### 3.5 FINISH

- A. All sidewalk surfaces should have a textured, non-slip broom finish free from trowel marks, except for the edging tool.

END OF SECTION 32 13 13

## **SECTION 32 15 40 – CRUSHED STONE SURFACING**

### **1. PART 1- GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.
  - 1. See Section 007300 “Supplementary Conditions”, if included, for requirements relating to interpretation of the drawings and specifications.

#### **1.2 SUMMARY**

- A. Work shall include all labor, materials, and equipment necessary to completely furnish and install the Crushed Stone Surfacing as indicated on the plans and as herein specified.
- B. This Section includes the following:
  - 1. Crushed Rock
  - 2. Gravel

#### **1.3 SUBMITTALS**

- A. Sieve Analyses: For aggregate materials, according to ASTM C 136
- B. Samples: N/A
- C. Test reports:
  - 1. Final compaction report.

#### **1.4 QUALITY ASSURANCE**

- A. Pre-installation
  - 1. The Contractor shall coordinate, schedule and conduct a meeting to review the installation requirements with the mix supplier and Architect.

#### **1.5 SITE CONDITIONS**

- A. Weather and site requirements
  - 1. Aggregate base or sub-base is to be dry or moist.

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

#### **2.1 MATERIALS**

- A. Crushed Rock (Base Course)
  - 1. General:
    - a. Crushed rock shall be either limestone or dolomite and shall consist of clean, hard, tough and durable fragments (excluding schist, shale or slate) of uniform quality throughout and shall be free from thin, soft, or elongated pieces, disintegrate

stone, dirt, organic or other deleterious material occurring free or as a coating on the rock.

2. Gradation:

- a. The crushed rock for surfacing shall be screened after crushing to remove excessive fines and shall be so graded as to meet the following requirements

|    |            |                 |
|----|------------|-----------------|
| 1) | Sieve Size | Percent Passing |
|    | 1-1/2"     | 94-100          |
|    | 1/2"       | 0-10            |

3. Soundness:

- a. The fraction of crushed rock retained on the 1/2"-inch sieve shall have a loss ratio of not less than 0.75 when subjected to 26 cycles of freezing and thawing in accordance to AASHTO Method T-103.

4. Abrasion:

- a. Crushed rock, when tested for abrasion by AASHTO Method T-96, Grade B, shall have a percentage of wear of not more than 45 percent.

B. Gravel (Surface Course)

1. General:

- a. Gravel for surfacing shall consist of durable particles of stone and sand with less than five percent (5%) of clay and silt

2. Gradation:

- a. The sieve analysis for the gravel material shall be made in accordance with AASHTO Method T-27 and shall be so graded as to meet the following requirements:

|    |                    |                         |
|----|--------------------|-------------------------|
| 1) | <u>Sieve Size:</u> | <u>Percent Passing:</u> |
|    | 1"                 | 100                     |
|    | #4                 | 61-95                   |
|    | #10                | 0-30                    |
|    | #200               | 0-4                     |

- 2) The percent passing the No. 200 sieve shall be determined in accordance with AASHTO Method T-11

3. Approved Equal: Crushed Asphalt (1" minus) or Crushed Concrete (1" minus)

C. Water

1. Fresh, clean, and potable.

**3. PART 3- EXECUTION**

**3.1 EXAMINATION**

- A. Examine site and verify that conditions are suitable to receive work and that no defects or errors are present which would cause defective installation of product or cause latent defects in workmanship and function.



- B. Review subgrade to verify that it has been graded correctly and compacted as required for installation of the aggregate base.
- C. Before proceeding with work, Contractor shall notify the Architect and Owner in writing of any unsuitable conditions and conflicts.

### 3.2 PROTECTION OF EXISTING CONDITIONS

- A. Use every possible precaution to prevent damage to existing conditions to remain such as structures, utilities, irrigation systems, plant materials and paving on or adjacent to the site of the work.
- B. Provide barricades, fences or other barriers as necessary to protect existing conditions to remain from damage during construction.
- C. Contractor is fully responsible for all costs associated with replacement of damage caused by his work.

### 3.3 LAYOUT

- A. Establish lines and levels; locate and lay out by instrumentation and similar appropriate means for aggregate paving finish grades.
- B. Staking: Provide a sufficient quantity of grade stakes as required to provide aggregate paving with smooth finish grades and positive drainage.

### 3.4 SUB-GRADE PREPARATION:

- A. Refer to Geotechnical report for subgrade preparation prior to placement of aggregate base. Grade subgrade with uniform slope between points where elevations are given.
- B. Grade subgrade surface to within 0.05 foot of finish grade minus paving thickness.
- C. Fill and compact any depressions and remove loose material to finish true to line and grade, presenting a smooth, compacted and unyielding surface.
- D. Remove debris, loose dirt and other extraneous materials.
- E. Ditches, drains and drain pipes shall be installed if necessary to protect of the pavement and base from cross flows of water. All water flow should be directed off of and away from base.

### 3.5 PLACEMENT AND COMPACTION

- A. Parking Lot Surfacing
  - 1. In general, the construction shall include combining three inches of crushed rock (base course) in the upper layer of the sub-grade and the application of a three-inch gravel surface course to the crushed rock base, to the widths and cross section as shown on the plans.
  - 2. The crushed rock material shall be deposited uniformly upon an approved sub-grade in straight, single or double lines, followed immediately thereafter by scarification of the rock and sub-grade to produce a uniform soil-rock mixture six inches thick. The mixture shall be spread into a uniform layer and compacted using sheepsfoot roller and water as required. The gravel surface course material shall then be delivered and uniformly spread, followed immediately by compaction using an approved roller and water as required, to the satisfaction of the Architect and Owner.

### 3.6 FIELD QUALITY CONTROL

#### A. Density tests:

1. Perform tests in accordance with ASTM D 2950.
2. Perform tests after final compaction to 95% maximum density.
3. Perform at least three tests.

#### B. PROTECTION

1. Protect pavement surface against heavy construction equipment
  - a. Contractor is responsible for replacing damaged pavement, if damage was preventable, at his own expense.

END OF SECTION 32 15 40

## **SECTION 32 92 00 – TURF AND GRASSES**

### **1. PART 1- GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY OF WORK**

- A. Work shall include all labor, materials, and equipment necessary to completely furnish and install the Turf and Grasses as indicated on the plans and as herein specified.
- B. This section includes the following:
  - 1. Sodding

#### **1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated.
  - 1. Pesticides and Herbicides: Include product label and manufacturer's application instruction specific to this project.
- B. Certification of Grass Seed: From seed vender for each grass-seed monostand or mixture stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Included year of production and date of packaging.
  - 1. Certification of each seed mixture for turf grass sod and seed. Include identification of source, name and telephone number of supplier.
- C. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of manicured turf grass and native meadow grass during a calendar year. Submit before expiration of required initial maintenance periods.
- D. Qualification Data: For qualified landscape Installer.
- E. Material Test Reports: For existing native surface topsoil, existing in-place surface soil and imported or manufactured topsoil.
- F. Product Certificates: For fertilizers from manufacturer.

#### **1.4 QUALITY ASSURANCE**

- A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful turf establishment.
  - 1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association
  - 2. Experience: Five (5) years' experience in turf installation

3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project Site when work is in progress
4. Pesticide Applicator: State licensed, commercial.

#### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened container showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.
- B. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver Sod in time for planting within 24 hours of harvesting. Protect sod from breakage and drying.
- C. Bulk Materials:
  1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
  2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge or soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
  3. Accompany each delivery of bulk fertilizer and soil amendments with appropriate certificates.

#### 1.6 PROJECT CONDITIONS

- A. Proceed with and complete seeding work as rapidly as portions of site become available, working within seasonal limitations.
- B. Protect existing utilities, paving, plant material, and other facilities from damage caused by seeding operations.
- C. Perform seeding work only after planting and other work affecting ground surface has been completed.
- D. Restrict pedestrian, bicycle, vehicular and other traffic from lawn areas until grass is established. Erect signs and barriers as required.
- E. Provide hose and lawn watering equipment as required.
- F. Planting Restrictions: Plant during one of the following periods.
  1. Spring Planting: May 15-June 30 for cool and warm season grasses.
  2. Fall planting: September 1-October 15 for cool season grasses only and dormant planting is to be November 1-December 15. Seeding operations shall occur immediately after preparation of bed during this season only, except when prior written permission is obtained from the Architect.
  3. Weather Limitations: The actual planting shall be performed during those times in this season which are normal for such work as determined by weather conditions, and accepted practice in the locality. No work shall be performed when the ground is frozen, wet or otherwise un-tillable or when even distribution of materials cannot be obtained.

#### 1.7 MAINTENANCE SERVICE

1. Initial Turf Maintenance Service: Provide full maintenance until fully established by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable turf is established.

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

### **2.1 TURFGRASS SOD**

- A. Turfgrass Sod: Approved, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color and texture, strongly rooted, and capable of vigorous growth and development when planted.

- B. Sod Mixture type:

1. Missouri DNR Special Mixture, or approved equal:

|        |                     |
|--------|---------------------|
| 49.15% | Kentucky Bluegrass  |
| 29.40% | Creeping Red Fescue |
| 19.60% | Perennial Ryegrass  |

### **2.2 FERTILIZERS**

- A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast-and slow-release nitrogen, 50 percent derived from natural organic sources or urea formaldehyde, phosphorous, and potassium in the following composition:

1. Composition: 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

- B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil report from a qualified soil-testing laboratory.

### **2.3 WATER**

- A. Water: Free of substance harmful to seed growth. Hoses or other methods of transportation furnished by Contractor.

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

### **3.1 EXAMINATION**

- A. Examine areas to be planted for compliance with requirements and other conditions affecting performance.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel,

- paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
  - 2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
  - 3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
  - 4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
  - C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

### 3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
  - 1. Protect grade stakes set by others until directed to remove them.
- B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

### 3.3 TURF AREA PREPARATION

- A. Limit turf subgrade preparation to areas to be planted.
- B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 4 inches . Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
- C. Unchanged Subgrades: If turf is to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:
  - 1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
  - 2. Loosen surface soil to a depth of at least 6 inches. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 4 inches of soil. Till soil to a homogeneous mixture of fine texture.
  - 3. Remove stones larger than 1 inch in any dimension and sticks, roots, trash, and other extraneous matter.
  - 4. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.
- D. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.
- E. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- F. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

### 3.4 SODDING

- A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.
- B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.
  - 1. Lay sod across angle of slopes exceeding 1:3.
  - 2. Anchor sod on slopes exceeding 1:4 with wood pegs or steel staples spaced as recommended by sod manufacturer but not less than 2 anchors per sod strip to prevent slippage.
- C. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below sod.

### 3.5 TURF MAINTENANCE

- A. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.
  - 1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
  - 2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
  - 3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.
- B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.
  - 1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
  - 2. Water turf with fine spray at a minimum rate of 2 inch per week unless rainfall precipitation is adequate.
- C. Mow manicured turf grasses as soon as top growth is tall enough to cut. Repeat mowing to maintain a min 2.5 inch to 3 inch height without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:

### 3.6 SATISFACTORY TURF

- A. Turf installations shall meet the following criteria as determined by Architect:

1. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.

- B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

### 3.7 PESTICIDE APPLICATION

- A. Apply pesticides and other chemical products and biological control agents in accordance with requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.
- B. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.

### 3.8 CLEANUP AND PROTECTION

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

END OF SECTION 32 92 00



## SECTION 33 71 19 – ELECTRICAL UNDERGROUND DUCTS

### 1. GENERAL

1.1 The scope of this document is to provide instruction for installation and testing of electric power duct banks installed within the Whiteman Air Force Base.

### 1.2 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to work of this Section.

1.3 This Section is a Division 26 "Basic Materials and Methods" section and is part of each Division 26 section making reference to wires and cables specified herein

### 2. MATERIALS

#### 2.1 Electric Underground Ducts

##### A. Conduit

1. Underground concrete encased electric conduit duct banks shall consist of Type DB-60 polyvinyl chloride (PVC) conduit rated for 105°C cable and meeting NEMA Standard TC-6 and ASTM F-512 for underground applications.
2. The standard conduit size shall be 5" for all conduits.
3. Conduits shall have long rigid steel metallic sweep elbows, 48" minimum radius for horizontal bends and 36" radius for vertical bends. Conduit elbows shall be PVC coated with taped ends.
4. All joints shall have watertight seals.
5. Conduit End Bells
  - a. Conduit end bells for PVC conduit shall be polyvinyl chloride (PVC).
  - b. Conduit end bells for rigid galvanized steel conduit shall be hot-dipped galvanized malleable iron or steel, threaded to the end of the rigid galvanized steel conduit.

##### B. Concrete

#### 1. Color Additive

- a. The concrete for all concrete encased conduit duct banks shall have a medium red color additive. The color additive shall have a minimum concentration per manufacturer's recommendation per yard of concrete and shall be mixed throughout the entire duct bank concrete.

#### 2. Admixtures

- a. Air-entraining mixture shall be used for all exterior concrete and shall conform to ASTM C260. The total calculated air content by volume as determined by ASTM C231 shall be as follows:
- b.

| <u>Maximum Coarse<br/>Aggregate Size</u> | <u>Total Air Content, %<br/>Includes Trapped Air</u> |
|--|--|
| 3/4"                                     | 3-8  |
| 1"                                       | 4-6  |

- c. Water reducing admixture shall be used to reduce the total water requirements. Water reducing admixture shall meet the requirements of ASTM C494, Type A.
- d. Calcium chloride or accelerating admixtures containing calcium chloride shall not be used.
- e. Proportioning
  - 1) Concrete slump at the time of placement as determined by ASTM C13 shall be 3" to 4". Tolerance up to 1" above maximum will be allowed providing average of batches tested does not exceed maximum.
  - 2) The minimum 28 day concrete compressive strength for concrete shall be 4,000 psi (6 sacks/cu. yd. minimum).
- f. Reinforcement
  - 1) All concrete encased electric conduit duct banks shall contain steel reinforcing throughout the entire length as indicated on Typical Duct Bank Detail.dwg. The minimum size of reinforcing steel shall be size No. 4.
- g. Backfill
  - 1) Backfill material shall be clean soil fill. No concrete or large rocks are to be used. Backfill shall be compacted as installed.

### **3. ACCESSORIES**

- 3.1 The pull string installed in spare conduits shall have a minimum of 240 lbs. tensile strength and shall be rot and mildew resistant. Pull string shall have permanently printed sequential measurements at one foot increments.
- 3.2 Use plastic plugs with wick for drainage to seal spare conduits in manholes.
  - A. Underground Warning Tape
    - 1. Warning tape shall be fabricated from polyethylene film, and shall be 6 inches wide and not less than 3.5 mils thick.
    - 2. Warning tape shall be high visibility red in color and imprinted at frequent intervals with black letters having the following wording: CAUTION BURIED ELECTRICAL LINE BELOW

### **4. INSTALLATION**

- 4.1 Conduit and Duct Banks
  - A. Conduit shall be adequately and properly supported on solid earth, or other indicated means, throughout the entire length of the run. All conduits shall be laid straight and true.
  - B. Verify routing locations of conduit prior to rough-in.
  - C. Couplings for conduits in a group shall be staggered at least six (6) inches.
  - D. Underground conduit duct banks shall be installed a minimum of 36" below finished grade to the top surface of the duct bank.

- E. Underground conduit duct banks shall be at least 12 inches away from all other underground utilities; gas, water, electric, telephone, communications, etc., and at least 36 inches away from steam pipe lines and steam tunnels, trenches, or manholes.
- F. Conduits shall be installed with a minimum slope of ½% toward manholes or other drainage points.
- G. Intermediate and base spacers shall be used to obtain uniform separation and alignment during the installation of the concrete for concrete encased duct banks. Maximum intervals between spacers shall be 8 feet.
- H. Concrete encased conduit duct bank penetrations into manholes shall continue completely through the wall of the manhole and shall use one large hole rather than several smaller holes. If this method is not practical, the concrete may stop outside the manhole but must be pinned to the manhole with steel pins to prevent any differential settlement.
- I. Conduit end bells shall be installed at all conduit terminations in each manhole.
  - 1. Conduit end bells for PVC conduit shall be cast in place concrete wall of the manhole glued to each end of the type DB PVC conduit.
  - 2. Conduit end bells for rigid galvanized steel conduit shall be cast in place in the concrete wall of the manhole.
- J. All duct banks used for 12470V system shall be encased in red concrete.
- K. Concrete Placing, Curing, and Backfill
  - 1. Precautions shall be used to prevent ducts from floating.
  - 2. Concrete shall be placed with the aid of a mechanical vibrator.
  - 3. Curing shall be continued for at least 7 days in the case of all concrete except high-early-strength concrete for which the period shall be at least 3 days. Excavations should not be backfilled until concrete has cured.
  - 4. In no cases shall ductbank sidewall thickness exceed 12" from side of duct.
- L. Reinforcement
  - 1. The reinforcing steel shall be installed longitudinally, at each corner of the duct bank (in cross section) and along the top and bottom and sides at a maximum of 12 inches on center. All reinforcing steel (including bottom) shall have a minimum concrete cover of 1-1/2 inches. Reinforcing shall be installed latitudinal, as needed, to hold the longitudinal steel in place during the placement of the concrete but no more than 48" apart. Refer to the Ductbank Details in the plans.

#### 4.2 Accessories

- A. All empty or "spare" conduits shall have a nylon or polypropylene pull string installed for future use. Leave not less than 2 feet of slack at each end of pull string.
- B. Seal the ends of all conduits at manhole penetrations. Seal water tight with plastic plugs with wick for drainage. Conduit pull string shall penetrate through seal.

#### 4.3 Underground Warning Tape

- A. The location of all underground conduit duct banks shall be marked by burying one or more warning tapes below grade in the backfill. The warning tape shall be placed 18 inches above the top of the conduit(s) or duct bank and shall be parallel along the full length of the run.
- B. If the widths of the conduits or duct bank is wider than 2 feet, two or more warning tapes shall be used, all in the same plane, spacing the tapes no more than 12 inches apart horizontally across the top width of the conduits or duct bank and equally spacing the tapes in from each longitudinal outer edge of the buried conduits or duct bank

## **5. TESTING**

### **5.1 Electric Underground Duct**

- A. All duct banks shall be inspected by system owner prior to concrete placement.
- B. Upon completion of the installation of each duct bank, demonstrate that all conduits are clear of obstructions by pulling a mandrel  $\frac{1}{2}$  inch smaller than the nominal size of the conduit through the entire length of each conduit.

### **5.2 Electric Underground Duct**

- A. All soil and debris shall be removed from manholes and equipment pads where ductbanks terminate.
- B. Verify all pull strings and caps are installed

END OF SECTION 33 17 19

## **SECTION 33 73 13 – LIQUID-FILLED UTILITY TRANSFORMERS**

### **1. GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specifications sections, apply to work of this Section.

#### **1.2 DESCRIPTION OF WORK**

- A. Types of transformers specified in this Section include:
  - 1. Insulated, liquid filled, pad-mounted transformers

#### **1.3 REFERENCES**

- A. Comply with the following Codes, Standards and references as they relate to specified equipment:
- B. DOE 2010, 10 CFR Part 431 requirements.
- C. IEEE C37.47™ - Specifications for Distribution Fuse Disconnecting Switches, Fuse Supports, and Current-Limiting Fuses.
- D. IEEE C57.12.00™ - Standard General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers.
- E. IEEE C57.12.34™ – Requirements for Pad-Mounted, Compartmental-Type, Self-Cooled, Three-Phase Distribution Transformers, 2,500 kVA and Smaller: High Voltage, 34,500 GrdY/19,900 Volts and Below; Low Voltage, 480 Volts and Below.
- F. ANSI C57.12.28 - Switchgear and Transformers, Pad-Mounted Equipment - Enclosure Integrity.
- G. IEEE C57.12.90™ - Standard Test Code for Liquid-Immersed Distribution Power, and Regulating Transformers and Guide for Short-Circuit Testing of Distribution and Power Transformers.
- H. IEEE C57.13™ - Requirements for Instrument Transformers.
- I. ANSI/IEEE 386 - Separable Insulated Connector Systems for Power Distribution Systems Above 600 V.
- J. ASTM D877 - Test Method for Dielectric Breakdown Voltage of Insulating Liquids Using Disk Electrodes.
- K. NEMA AB1 - Molded Case Circuit Breakers.
- L. CAN/CSA-C88-M90 - Electrical Power Systems and Equipment.
- M. NEC and NESC Compliance: Comply with the NEC and the NESC as applicable to the installation and construction of electrical power distribution equipment.

- N. NEMA Compliance: Comply with applicable portions of NEMA Standard Publications TR1 and TR27 pertaining to power/distribution transformers.
- O. Federal Occupational Safety and Health Standards.
- P. ANSI C57.12

#### 1.4 SUBMITTALS

- A. Transformer Product Data: Submit manufacturer's technical product data including rated KVA, frequency, primary and secondary voltage, percent taps, polarity, impedance and certification of transformer performance efficiency at indicated loads, no-load and full-load losses in watts, temperature rise above 40 degrees C ambient and standard published data.
- B. Transformer Shop Drawings: Submit manufacturer's drawings indicating transformer dimensions and weight. Submit drawings that show transformer layout, mounting and support details.
- C. The Architect/Engineer must review all submittal information.
- D. Whiteman Air Force Base Energy and Utilities Group must approve submittal information prior to purchase/construction of transformer.
- E. A completed "Transformer Losses in Watts" data sheet (see below) must be completed for each type of transformer. Losses cannot exceed the values listed in the table below. A duly authorized officer of the transformer supplier must sign the data sheet. This data sheet will serve to guarantee the validity of the losses stated. Tested impedance of the supplied transformer shall be in the range as specified in the table below.

| Size<br>(kVA) | Secondary<br>Voltage | Losses Not To Exceed (Watts) |           |       | Impedance<br>(in the range of) |
|---------------|----------------------|------------------------------|-----------|-------|--------------------------------|
|               |                      | No Load                      | Full Load | Total |                                |
| 225           | 277/480              | 600                          | 1200      | 1800  | 2.5% to 4.0%                   |
| 300           | 277/480              | 750                          | 1500      | 2250  | 2.5% to 4.0%                   |
| 500           | 277/480              | 1000                         | 2800      | 3800  | 5% to 6%                       |
| 750           | 277/480              | 1200                         | 4000      | 5200  | 5% to 6%                       |
| 1000          | 277/480              | 1500                         | 6500      | 8000  | 5% to 6%                       |
| 1500          | 277/480              | 2200                         | 9000      | 11200 | 5% to 6%                       |
| 2000          | 277/480              | 2800                         | 12000     | 14800 | 5% to 6%                       |
| 2500          | 277/480              | 3800                         | 16000     | 19800 | 5% to 6%                       |
|               |                      |                              |           |       |                                |
|               |                      |                              |           |       |                                |

### Transformer Losses in Watts Data Sheet

Manufacturer: \_\_\_\_\_

Project: \_\_\_\_\_

### Transformer Information

| Transformer Type | kVA | High Side Voltage | Low Side Voltage | No Load Losses | Full Load Losses | Total Losses |
|------------------|-----|-------------------|------------------|----------------|------------------|--------------|
|                  |     |                   |                  |                |                  |              |
|                  |     |                   |                  |                |                  |              |
|                  |     |                   |                  |                |                  |              |
|                  |     |                   |                  |                |                  |              |
|                  |     |                   |                  |                |                  |              |
|                  |     |                   |                  |                |                  |              |

Signed: \_\_\_\_\_

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

- F. The Owner must receive a certified test report of the 60Hz losses of all transformers supplied fourteen (14) days prior to installation of transformers. This report must show, at rated voltage, both no load and full load (coil) losses for each transformer purchased listed by manufacturer serial number.

## 2. PRODUCTS

### 2.1 MANUFACTURER

- A. Subject to compliance with requirements, provide products of one of the following manufacturers:

1. Padmount Transformers:
  - a. Cooper Industries; Cooper Power Systems Division.
  - b. Eaton.
  - c. Federal Pacific Transformer Company; Division of Electro-Mechanical Corp.
  - d. GE Electrical Distribution & Control.
  - e. Siemens Energy & Automation, Inc.

### 2.2 PADMOUNT TRANSFORMERS - GENERAL

- A. All transformer equipment shall be new. Units containing re-built, used, re-manufacturer, or re-constructed parts will not be accepted.

- B. Furnish and install a padmounted, low profile, compartmental type transformer as specified herein. The padmounted transformer shall be a three-phase distribution type unit specifically designed for serving underground systems. The transformer and associated terminal compartments shall be designed and constructed to be tamper resistant with self-starting penta-head bolts. There shall be no screws, bolts or other fastening devices that are externally removable. The transformer shall be shipped as a complete unit so that field installation requirements are limited to mounting the unit on a concrete pad and connecting it to primary and secondary feeder circuits. There shall be no openings where sticks, rods or other devices could be inserted and contact live parts. Transformer compartments shall limit water entry.
- C. The pad mounted compartment transformer shall consist of the transformer tank with high and low voltage cable terminating compartments. The high voltage compartment shall be located on the left side of the equipment, as viewed from the front. The high voltage compartment shall be separated from the low voltage compartment by a metal barrier. The transformer tank and cable terminating compartments shall be assembled as an integral unit with no live parts accessible without opening compartment doors. Each unit shall be suitable for mounting on a concrete pad. Security for the enclosure shall meet the requirements of ANSI Standard C57.12.26, paragraphs 7.5 and 7.6. There shall be no external, intermittent welds.
- D. The unit shall be constructed so that it can be lifted, skidded, or slid into place on the concrete pad without disturbing previously installed cabling.
- E. Bushing and terminal wells shall be located on the tank wall that is common to the high voltage and low voltage terminal compartments. The location and sequence shall be shown in ANSI C57.12.26.
- F. The transformer shall be furnished with three grounding connections; each with two (2) 1/2"-13 UNC tapped holes. Grounding connections shall be provided in the primary compartment, the secondary compartment and outside the tank. A copper connection strap from the neutral to ground shall be provided.
- G. Terminal designations shall be as defined by ANSI C57.12.70. Terminal designations shall be clearly marked on the unit with permanent, oil resistant yellow paint or pressure sensitive markers.
- H. Suitable jack bosses or equivalent jacking facilities shall be provided on the tank. Lifting provisions shall be provided in accordance with ANSI C57.12.26.
- I. The base of the assembly shall be provided with a suitable flange to permit anchoring the unit on the concrete pad from within the cable terminating compartments.
- J. "Warning" and "Danger" signs (Brady or equivalent) shall be applied to the lockable door in accordance with applicable NEMA Standards Publications. The minimum size sign shall be 5" by 9".
- K. Low voltage bushing shall be supported to the top of the transformer to prevent oil leaking from the bushing due to the weight of the cables attached to them.
- L. A clear, non-conductive, hinged barrier, with latching mechanism shall be installed in the low voltage compartment in a manner which will completely restrict access to the low voltage compartment. Barrier shall be clearly marked "Danger Arc Flash Hazard".
- M. Noise levels shall meet all IEEE, ANSI and NEMA standards in addition to not exceeding the levels given by NEMA TR1-1980.



- N. The transformer core shall be steel core stock and shall be designed and constructed to reduce eddy current losses at fundamental and harmonic frequencies.

## 2.3 THREE PHASE PADMOUNTED TRANSFORMERS

- A. Rating: Transformer ratings shall be as indicated on the drawings. Primary voltage shall be **12,470 volts** line-to-line, three-phase, delta configuration. Secondary voltages shall as indicated on the drawings. Transformers shall be non flammable oil-filled, self-cooled, padmounted, loop feed (connected in radial configuration as indicated on the drawings), dead front type, with a no-load, tap changer control handle shall be provided and located in the high voltage compartment. The tap changer control handle shall be for de-energized operation only. The transformer impedance shall be **2.5 %Z**. The tolerance shall be plus or minus 7.5% of the design impedance.
- B. Coolant shall be nonflammable fluid, free of PCBs. The high voltage insulation level shall be 95 KV BIL with 15 KV insulation class. The low voltage rating shall be 30 KV BIL with 1.2 KV insulation class.
- C. The padmounted transformer shall be constructed in accordance with ANSI Standard C57.12.26 for three phase dead front application. All characteristics, definitions, terminology, voltage designations and tests, except as otherwise specified herein shall be in accordance with American National Standards Requirements, Terminology and Test Code for Distribution, Power and Regulating Transformers.
- D. The transformer shall have three separate windings on the primary and secondary sides. "T" connections are not allowed. All windings shall be copper. Primary windings shall be designed to withstand high 3<sup>rd</sup>, 9<sup>th</sup> and 15<sup>th</sup> harmonic circulating currents.

## 2.4 TEMPERATURE RISE LIMITS

- A. The average winding temperature rise above ambient, when tested in accordance with transformer ratings, shall not exceed 65 degrees C. (Average winding temperature rise by resistance).
- B. The hot spot temperature rise above ambient, when tested in accordance with transformer ratings, shall not exceed 80 degrees C.
- C. Winding insulation shall have a temperature rating of 125 degrees C.
- D. Transformer shall have a temperature rating of 40 degrees C.

## 2.5 TANKS

- A. The transformer tank shall be of sufficient strength to withstand a pressure without permanent distortion. A 1" pipe plug shall be provided for tank fill and pressure testing.
- B. Tank grounding shall be in accordance with ANSI C57.12.26.

## 2.6 TERMINAL COMPARTMENTS

- A. Full height, air-filled incoming and outgoing terminal compartments with hinged doors shall be located side by side separated by a permanent steel barrier, with the incoming primary compartment on the left (when facing the front of the transformer). The incoming primary compartment will be accessible only after the door to the outgoing secondary compartment has been opened. Compartments shall be oversized, as required for conduit entrance. To facilitate making connections and to permit cable pulling, the doors and compartment hood shall be removable. The unit must have removable door sills

## 2.7 HIGH VOLTAGE COMPARTMENT

- A. Transformer shall have Dead Front primary connections including bushing wells and bushings, dead front design with a 95kV BIL rating. The transformer primary compartment shall be separated from the secondary compartment by a permanent metal barrier. A clearance of 12 inches between the nearest high voltage bushing and the compartment walls must be maintained. Transformer high voltage compartment shall include (3) elbow type lightning arrestors for unused primary terminations. Arrestors shall be 10kV rated, 8.4kV (MCOV) as manufactured by Elastimold of Cooper.
- B. Primary Bushings
  - 1. Shall have a 95kV BIL rating
  - 2. Shall have 15kV, 600A bushings for non-load breaker, bolted elbow connection.
  - 3. Shall conform to ANSI/IEEE Standard 386 (ANSI Standard C119.2)
  - 4. Shall include a semiconductive coating.
  - 5. Shall be mounted in such a way that the semiconductive coating is solidly grounded to the tank.
  - 6. Shall have covers in place for shipping and storage.
  - 7. Dead front Loop Feed – Six (6) 600A primary bushings, suitable for wye connection of 12,470V dead break elbow connectors.
- C. Fusing shall consist of oil immersed bayonet expulsion fuses (sized for 170% of full load current) and in-tank, current limiting fuses. Bayonet fuses shall be removable with a hot stick. Current limiting fuses shall have an interrupting capacity greater than 40,000A. Fusing combination shall provide full range protection for low and high current faults. Three spare bayonet fuses shall be supplied with each transformer. Spare fuses shall be placed in a pocket on the door to the secondary compartment. Door shall be stenciled above the fuse pocket showing the size and type of replacement fuses. The let through current of the in-tank current limiting fuse cannot exceed the interrupting rating of the switch specified.
- D. Provide a load break, gang operated, liquid immersed switch rated at 300A that is externally operable from the high voltage compartment through the use of a distribution hot-stick. Switch to be 4-position "sectionalizing" type for use on an extended radial or loop-feed system. Switch operating modes shall be; source "A" only, source "B" only, source "A" and "B" loop feed, and source "A" and "B" looped and transformer disconnected.
- E. Primary voltage taps shall be supplied to provide five (5) – 2.5% no load tap changes, two above and two below rated voltage.

## 2.8 LOW VOLTAGE COMPARTMENT

- A. The low voltage transformer bushings and terminals shall have an insulation class of 1.2 KV with a 30 kV BIL rating with a tinned spade having (8)-9/16" diameter holes on 1 3/4" centers for conductor connections.

- B. Low voltage bushings shall be externally clamped, epoxy filled. Low voltage line and neutral terminals shall be arranged for vertical takeoff and mounted in a staggered configuration on the tank wall. Minimum horizontal and vertical spacing between terminals shall be as shown in ANSI C57.12.26. Bushings shall be supported to the top of transformer to prevent oil leaking from the bushing due to the weight of the cables attached to them.
- C. The outgoing line compartment shall be arranged for cabling from below. The compartment door will be hinged, have a 3-point latch and will be suitable for padlocking. All grounded wye rated secondaries shall have an insulated low voltage neutral bushing with an externally removable ground strap plus 3 line bushings.

## 2.9 ENCLOSURE

- A. Transformer enclosure shall be equipped and/or meet the following criteria:
  - 1. Enclosure shall be supplied with jacking provisions and lugs for lifting.
  - 2. Enclosure and base shall be constructed for sliding and rolling.
  - 3. Enclosure shall be tamper proof.
  - 4. Enclosure shall have self-starting pent-head bolts.
  - 5. Enclosure shall prevent accumulation and pooling of water.

## 2.10 DOORS

- A. The secondary door shall include provisions for a lock, which must be removed to remove the penta-head bolt.
- B. The primary door shall be separate and interlock with the secondary door in a manner, which the secondary door must be opened first before the primary door can be opened.
- C. The primary door shall also be secured by penta-head bolts other than the bolts securing the secondary door.

## 2.11 PAINT

- A. Munsell green #7.0GY3.291.5
- B. Minimum thickness of 2.5MIL
- C. A small container of touch up paint shall be supplied with the transformer and given to the owner.
- D. In addition to the regular finish, a corrosion preventing undercoating shall be applied to all surfaces. Paint shall be of such quality to resist corrosion, fading, etc. for a minimum 10 – 15 year period (when exposed to the elements), and shall meet or exceed EEI finishing requirements.

## 2.12 ACCESSORIES

- A. The transformer shall be equipped with, but not limited to the following accessories as standard equipment.
- B. HIGH VOLTAGE COMPARTMENT
  - 1. ANSI tank ground with (1) ½-B tapped hole 7/16" deep. One inch filling plug mounted in the cover. One inch drain plug mounted in the cover.

## C. LOW VOLTAGE COMPARTMENT

1. The instruction nameplate shall be located on the inside of the secondary compartment door and shall be readable with the cables in place. Nameplates shall be of stainless steel construction and shall contain the information required by ANSI/IEEE standards. The identification of terminal connections shall be shown on the instruction nameplate. The instruction nameplate shall show the date the unit was manufactured. The nameplate shall be engraved and shall contain the following additional information: KVA rating, primary and secondary voltages, full load secondary current, BIL ratings, temperature ratings, primary and secondary voltages for each tap setting, primary amperage rating for each tap setting, date of manufacture, name of manufacturer, transformer K factor (if applicable), type of conductor in windings, impedance expressed in percentage, detailed circuit diagrams of primary switch configuration and switch ratings, diagram detailing the relationship of primary to secondary bushings, statement that transformer is filled with non-flammable fluid, statement that transformer is filled with fluid containing no detectable PCB's, total weight of unit in pounds, weight of unit without oil.
2. Automatic pressure relief valve, Qualitrol Series 201.
3. Dial type thermometer, liquid level gauge and vacuum pressure gauge.
4. One-half inch sampling device located in the low voltage terminal compartment.

### 2.13 OIL PRESERVATION

- A. Certification shall be provided that the insulation/cooling oil contained in the transformer contains no more than two parts per million-polychlorinated byphenol (PCB). A permanently affixed blue label or nameplate will be provided to indicate the same.
- B. A sealed tank system with gasketed bolt-on cover and hand hole shall be standard on the transformer. A sealed tank system is one in which the interior of the transformer is sealed from the atmosphere throughout its top oil temperature range, and in which the gas plus the oil volume remains constant. The transformer shall remain effectively sealed through a top oil temperature range of minus 5 degrees C to 105 degrees C, provided the initial level was properly adjusted.
- C. Transformer shall be filled with a nonflammable fluid (mineral oil is not acceptable).
- D. A liquid level indicator shall be supplied and located inside the low voltage compartment.
- E. A drain valve and sampling device shall be installed in the primary compartment.
- F. Temperature indicator shall be supplied.

### 2.14 SWITCHING

- A. Switching needs for a loop fed configuration include:
  1. Three 300A load break switches
  2. This allows for transformer on/off and two line terminals each with on/off.
  3. Switch must be rated to interrupt the current for the transformer.
  4. Switch must be capable of being operated with a hot stick. Mount a sampling device in primary compartment.

### 2.15 LABELING

- A. Transformer shall have a "Danger-High Voltage" label on the outside of the primary compartment door meeting all applicable standards.
- B. Transformer shall have "Secondary Barrier Installed" label on the outside of the secondary compartment door.

### **3. EXECUTION**

3.1 Install transformers as indicated, complying with manufacturer's written instructions, applicable requirements of NEC, ANSI, NEMA and IEEE standards, and in accordance with recognized industry practices to ensure that products fulfill requirements.

3.2 Concrete pads shall be provided for each transformer. The Contractor shall be responsible for the coordination of the concrete pad openings and sizes. All other apparatus and equipment required to make a complete workable system shall be provided by the Contractor, at no extra cost to the Owner.

### **3.3 TESTING**

- A. Provide testing of transformer and meter equipment in accordance with applicable ANSI Standards. All test results and certifications shall be provided to the Owner.

END OF SECTION 33 73 13

## SECTION 401 PLANT MIX BITUMINOUS BASE AND PAVEMENT

**401.1 Description.** This work shall consist of a bituminous mixture placed, spread and compacted as shown on the plans or as directed by the engineer.

### 401.2 Material.

**401.2.1** The grade of asphalt binder will be specified in the contract. When the plasticity index on individual aggregate fractions with 10 percent or more passing the No. 30 sieve exceeds 3, a moisture susceptibility test shall be required in accordance with Sec 401.4.5 during the mix design process. If the plasticity index exceeds that of the material approved for the mix design, additional testing may be required. All material shall be in accordance with Division 1000, Material Details, and specifically as follows:

| Item                                    | Section       |
|---|---------------|
| Coarse Aggregate                        | <u>1004.2</u> |
| Fine Aggregate                          | <u>1002.3</u> |
| Mineral Filler                          | <u>1002.4</u> |
| Hydrated Lime                           | <u>1002.5</u> |
| Asphalt Binder, Performance Graded (PG) | <u>1015</u>   |

**401.2.2 Reclaimed Asphalt.** Reclaimed Asphalt may be obtained from Reclaimed Asphalt Pavement (RAP) and Reclaimed Asphalt Shingles (RAS). The asphalt binder content of recycled asphalt materials shall be determined in accordance with AASHTO T 164, ASTM D 2172 or other approved method of solvent extraction. A correction factor for use during production may be determined for binder ignition by burning a sample in accordance with AASHTO T 308 and subtracting from the binder content determined by extraction.

The use of reclaimed asphalt shall be limited to one of the following options with the exception of bituminous base. For bituminous base the limits specified may be increased according to the recycled materials used as follows; 10% for RAP only, 5% for RAS only and 10% for the appropriate RAP and RAS combination.

| Binder   | Percent Effective Virgin Binder Replacement |         |                                |
|--|---|---------|--------------------------------|
|  | RAP   | RAS     | RAP and RAS combination        |
| Contract Grade Virgin Binder shall be used                       | 0 - 20                                      | 0 - 10  | $RAP + (2 * RAS) \leq 20$      |
| Virgin Binder shall be Softened One Grade <sup>a</sup>           | 21 - 40                                     | 11 - 20 | $20 < RAP + (2 * RAS) \leq 40$ |
| Blend Chart <sup>b</sup>   | 0 - 100                                     | N/A     | N/A                            |
| Extraction and Grading of Binder from final Mixture <sup>c</sup> | 0 - 100                                     |         |                                |

<sup>a</sup>The virgin binder shall have a low temperature grade 6 degrees lower than the binder grade specified in the contract. Lowering the high temperature of the virgin binder is not required; however, if lowered, the virgin binder shall have a high temperature grade no lower than 6 degrees below the binder grade specified in the contract. (Ex. Contract grade PG 64-22; virgin binder could be either PG 58-28 or PG 64-28). The Pressure Aging Vessel (PAV) test temperature (AASHTO M320) shall be tested at 19° C, regardless of the high temperature grade of the selected virgin binder

<sup>b</sup>Testing in accordance with AASHTO M323 including raw data shall be included with the mix design which demonstrates that the grade of the combine mixture meets the contract requirements.

<sup>c</sup>Testing in accordance with either AASHTO T319, or AASHTO T164 and R59 along with grading in accordance with AASHTO M320 including raw data shall be included with the mix design which demonstrates that the grade of the combine mixture and rejuvenator, if applicable, meets the contract requirements.

**401.2.2.1 Reclaimed Asphalt Pavement.** Reclaimed Asphalt Pavement (RAP) may be used in any Sec 401, Plant Mix Bituminous Base and Pavement. All RAP material, except as noted below, shall be tested in accordance with AASHTO T 327, Method of Resistance of Coarse Aggregate Degradation by Abrasion in the

Micro-Deval Apparatus. Aggregate shall have the asphalt coating removed either by extraction or binder ignition during production. The material shall be tested in the Micro-Deval apparatus at a frequency of once per 1500 tons. The percent loss shall not exceed the Micro-Deval loss of the combined virgin material by more than five percent. Micro-Deval testing will be waived for RAP material obtained from MoDOT roadways. All RAP material shall be in accordance with [Sec 1002](#) for deleterious and other foreign material. The aggregate specific gravity shall be determined by performing AASHTO T 209 in accordance with [Sec 403.19.3.1.2](#) and calculating the  $G_{se}$  to which a 0.98 correction factor will be applied in order to determine  $G_{sb}$  as follows:

$$G_{se} = \frac{100 - P_b}{G_{mm} - \frac{100 - P_b}{G_b}}$$

$$RAP\ G_{sb} = RAP\ G_{se} \times 0.98$$

See [Sec 401.4.4.1](#) for mixes containing more than 40% effective binder replacement from reclaimed asphalt.

**401.2.2.2 Reclaimed Asphalt Shingles.** Reclaimed Asphalt Shingles (RAS) may be used in any mixture specified to use PG 64-22 in accordance with AASHTO PP 53. In addition, shingles shall be ground to 3/8-inch minus. Waste, manufacturer or new, shingles shall be essential free of deleterious materials. Post-consumer RAS shall not contain more than 1.5 percent wood by weight or more than 3.0 percent total deleterious by weight. Post-consumer RAS shall be certified to contain less than the maximum allowable amount of asbestos as defined by national or local standards. The bulk specific gravity of RAS used in the job mix formula shall be 2.600.

$$RAS\ G_{sb} = 2.600$$

See [Sec 401.4.4.1](#) for mixes containing more than 40% effective binder replacement from reclaimed asphalt.

The gradation of the aggregate may be determined by solvent extraction of the binder or using the following as a standard gradation:

| Shingle Aggregate Gradation |                           |
|-----------------------------|---------------------------|
| Sieve Size                  | Percent Passing by Weight |
| 3/8 in.                     | 100                       |
| No. 4                       | 95                        |
| No. 8                       | 85                        |
| No. 16                      | 70                        |
| No. 30                      | 50                        |
| No. 50                      | 45                        |
| No. 100                     | 35                        |
| No. 200                     | 25                        |

**401.2.2.3 Rejuvenators.** Rejuvenators may be used in any asphalt mixture containing recycled material. When a rejuvenator is used for the purpose of softening the binder grade, the requirements for the Extraction and Grading of Binder from Final Mixture option in [Sec 401.2.2](#) must be satisfied.

**401.3 Composition of Mixtures.** Aggregate sources shall be from the specific ledge or combination of ledges within a quarry, or processed aggregate from a particular product, as submitted in the mix design. The total aggregate prior to mixing with asphalt binder shall be in accordance with the following gradation requirements:

| Sieve Size | Percent Passing by Weight |        |        |        |
|------------|---------------------------|--------|--------|--------|
|            | Base                      | BP-1   | BP-2   | BP-3   |
| 1 inch     | 100                       | 100    | 100    | 100    |
| 3/4 inch   | 85-100                    | 100    | 100    | 100    |
| 1/2 inch   | 60-90                     | 85-100 | 95-100 | 100    |
| 3/8 inch   | ---                       | ---    | ---    | 100    |
| No. 4      | 35-65                     | 50-70  | 60-90  | 90-100 |
| No. 8      | 25-50                     | 30-55  | 40-70  | ---    |
| No. 16     | ---                       | ---    | ---    | 30-60  |

|         |       |       |       |      |
|---------|-------|-------|-------|------|
| No. 30  | 10-35 | 10-30 | 15-35 | ---  |
| No. 200 | 4-12  | 5-12  | 5-12  | 7-12 |

**401.4 Job Mix Formula.** At least 30 days prior to placing any mixture on the project, the contractor shall submit a mix design for verification and approval by Construction and Materials. The mixture shall be designed in accordance with Asphalt Institute Publication MS-2, Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types. The mixture shall be compacted and tested at a minimum of three asphalt contents separated by a maximum of 0.5 percent in accordance with AASHTO T 245, except as herein noted. The test method shall be modified by short-term aging the specimens in accordance with AASHTO R 30. A detailed description of the mix design process shall be included with the job mix formula. Representative samples of each ingredient for the mixture shall be submitted with the mix design. Aggregate fractions shall be in accordance with the same proportions as the proposed job mix formula. A minimum of 150 pounds will be required for any individual fraction. The amount of each ingredient submitted shall be as follows for each mix design to be verified:

| Ingredient  | Minimum Amount |
|---|----------------|
| Aggregate   | 300 lbs        |
| Hydrated Lime, Mineral Filler and/or Baghouse Fines | 20 lbs         |
| Asphalt Binder                                      | 10 gal.        |

**401.4.1 Mixture Design.** Laboratories that participate and achieve a score of 3 or greater in the AASHTO proficiency sample program for T 11, T 27, T 84, T 85, T 166, T 209, T 308 and T 245 or T 312 will have the mixture verification process waived. The mix design shall be submitted to Construction and Materials for approval at least seven days prior to mixture production.

**401.4.2 Required Information.** The mix design shall include raw data from the design process and shall contain the following information:

- (a) All possible sources intended for use, and grade and specific gravity of asphalt binder.
- (b) Source, type (formation, etc.), ledge number(s) if applicable, gradation, and percent chert of each aggregate fraction.
- (c) Plasticity index of each aggregate fraction which has 10 percent or more passing the No. 30 sieve.
- (d) Bulk and apparent specific gravities and absorption of each aggregate fraction in accordance with AASHTO T 85 for coarse aggregate and AASHTO T 84 for fine aggregate, including all raw data, or in accordance with TM 81.
- (e) Specific gravity of hydrated lime, mineral filler or baghouse fines, if used, in accordance with AASHTO T 100.
- (f) Percentage of each aggregate component.
- (g) Combined gradation of the job mix.
- (h) Percent of asphalt binder, by weight, based on the total mixture.
- (i) Bulk specific gravity ( $G_{mb}$ ) by AASHTO T 166, Method A of a laboratory compacted mixture.
- (j) Percent air voids ( $V_a$ ) of the laboratory compacted specimen.
- (k) Voids in the mineral aggregate (VMA) and voids in the mineral aggregate filled with asphalt binder (VFA).
- (l) Theoretical maximum specific gravity ( $G_{mm}$ ) as determined by AASHTO T 209 in accordance with Sec 403.19.3 after the sample has been short-term aged in accordance with AASHTO R 30.
- (m) Mixing temperature and molding temperature.



(n) Bulk specific gravity ( $G_{mb}$ ) of the combined aggregate.

(o) Percent deleterious content of the combine aggregate.

(p) Baghouse fines added for design. Provide the combine gradation with and without the baghouse percentage.

**401.4.3 Mixture Approval.** No mixture will be accepted for use until the job mix formula for the project is approved by Construction and Materials. The job mix formula approved for each mixture shall be in effect until modified in writing by the engineer. When unsatisfactory results or other conditions occur, or should a source of material be changed, a new job mix formula may be required. In lieu of a new laboratory design, mixtures requiring adjustment beyond the limits allowed in Sec 401.8.2 may be designed in the field based on characteristics of plant-produced mixture in accordance with Sec 401 and verified by Construction and Materials, which may require new aggregate characteristics.

#### **401.4.4 Mixture Characteristics.**

**401.4.4.1** Base, BP-1, BP-2 and BP-3 mixtures shall have the following properties, when tested in accordance with AASHTO T 245 or AASHTO T 312. The number of blows with the compaction hammer shall be 35 or the number of gyrations shall be 35 with the gyratory compactor. BP-1 and BP-2 mixtures shall have between 60 and 80 percent of the VMA filled with asphalt binder and dust to effective binder ratio of 0.8 to 1.6. BP-3 mixtures shall be compacted with the gyratory compactor to 35 gyrations and shall have a minimum 75 percent of the VMA filled with asphalt binder and dust to effective binder ratio of 0.9 to 2.0.

| Mix Type | Percent Air Voids | AASHTO T 245 Stability lb | Voids in Mineral Aggregate (VMA) <sup>b</sup> |
|----------|-------------------|---------------------------|---|
| BB       | 3.5               | 750                       | 13.0 <sup>a</sup>                             |
| BP-1     | 3.5               | 750                       | 13.5  |
| BP-2     | 3.5               | 750                       | 14.0  |
| BP-3     | 3.5               | 750                       | 15.0  |

<sup>a</sup>Bituminous base mixtures that would require 12.0 percent VMA following Asphalt Institute MS-2 will have a minimum 12.0 percent requirement.

<sup>b</sup>If the effective virgin binder replacement from any combination of RAP and RAS is greater than 40 percent; then the minimum VMA required shall be increased by 0.5.

**401.4.4.2** When specified in the contract as BP-3NC, BP-3 mixtures containing limestone aggregate shall contain a minimum amount of non-carbonate aggregate as shown in the table below, or the aggregate blend shall have an acid-insoluble residue (A.I.R.), MoDOT Test Method TM 76, meeting the criteria of crushed non-carbonate material. The A.I.R. shall be determined on the minus No. 4 sieve. Non-carbonate aggregate shall have an A.I.R. of at least 85 percent insoluble residue.

| Aggregate | Minimum Non-Carbonate by Volume |
|-----------|---------------------------------|
| Limestone | 20% Minus No. 4                 |
| Dolomite  | No Requirement                  |

**401.4.5 Moisture Susceptibility.** When required moisture susceptibility shall be tested in accordance with AASHTO T 283. The mixture shall have a tensile strength ratio (TSR) of 70 percent or greater when compacted to 3.7 inches with  $7 \pm 0.5$  percent air voids. An approved anti-strip additive may be added to increase retained strength to a passing level. When testing is required by Sec 401.2.1 or Sec 401.9, the mixture shall be tested during production in accordance with Sec 403.19.

**401.4.6 Time Limit.** A mix design may be transferred to other projects for a period of three years from the original approval date provided satisfactory results are obtained during production and placement.

**401.5 Gradation and Deleterious Content Control.** The engineer shall be notified as soon as possible, but no

later than 24 hours if a change is made to the cold feed settings, hot bin settings or the binder content. The contractor shall determine the mixture gradation at the frequency stated in [Sec 401.8.1](#). The mixture gradation may be determined directly by using residual aggregate from the binder ignition process or by mathematical combination of the cold feed and recycled materials gradations. When the mathematical combination method is used, the RAS gradation shall be from the JMF and RAP gradation from the ignition or extraction residual aggregate. Mixtures as produced shall be subject to the following tolerances and controls:

(a) The maximum variations from the approved job-mix formula shall be within the tolerances as shown in the table below:

| Sieve Size         | Percent Passing by Weight |              |
|--------------------|---------------------------|--------------|
|                    | Tolerance                 | Action Limit |
| No. 8 <sup>a</sup> | ± 5.0                     | ± 10.0       |
| No. 200            | ± 2.0                     | ± 4.0        |

<sup>a</sup> Use No. 16 sieve for BP-3

(b) The deleterious content of the material retained on the No. 4 sieve shall not exceed the limits specified in [Sec 1004.2](#).

(c) The quantity of asphalt binder introduced into the mixer shall be the quantity specified in the job-mix formula. No changes shall be made to the quantity of asphalt binder without written approval from the engineer. The quantity of asphalt binder determined by tests on the final mixture shall not vary by more than - 0.3 to + 0.5 percent from the job-mix formula.

**401.5.1 Sample Location.** The gradations of the total aggregate will be determined from samples taken from the hot bins on batch-type plants or continuous mixing plants or from the composite cold feed belt on drum mix plants. The deleterious content of the total aggregate shall be determined from samples taken from the composite cold feed belt. When required, samples for plasticity index shall be taken from the stockpile. The RAP shall be sampled from the RAP feeding system on the asphalt plant. Samples for asphalt content determination may be taken at the plant.

**401.5.2 Substitutions.** At the option of the contractor and at no cost to the Commission, the contractor may use a [Sec 401](#) mixture with a smaller nominal maximum size aggregate or an approved [Sec 403](#) mixture, design level C, E, or F with the same or smaller nominal maximum size aggregate in lieu of any [Sec 401](#) mixture. When a [Sec 403](#) mixture is substituted, the layer thickness requirements of [Sec 403](#) will apply. The gradation, asphalt content, deleterious, and density acceptance of the substituted mixture during production will be in accordance with [Sec 401](#).

**401.5.3 Commercial Mixture.** If specified in the contract that an approved commercial mixture may be used, the contractor shall, at least seven days prior to the desired time of use, furnish a statement setting out the source and characteristics of the mixture proposed to be furnished. The statement shall include:

- (a) The types and sources of aggregate, percentage range of each, and range of combined gradation.
- (b) The percent and grade of asphalt binder.
- (c) The mixing time and range of mixture temperature.

The plant shall be designed and operated to produce a uniform, thoroughly mixed material free from segregation. It will not be necessary for the plant to meet the requirements of [Sec 404](#). A field laboratory will not be required. If the proposed mixture and plant are approved by the engineer, the component material and the mixture delivered will be accepted or rejected by visual inspection. The supplier shall furnish with the first truckload of each day's production, a certification that the material and mixture delivered are in conformance with the approved mixture. Upon completion of the work, a plant certification shall be furnished by the supplier for the total quantity delivered. The mixture shall be transported, placed and compacted in accordance with [Sec 401.7](#). Without specific contract designation, an approved commercial mixture may be used in lieu of plant mix bituminous pavement or base course mixtures for work that is considered temporary construction and is to be maintained at the contractor's expense. Temporary construction will be defined as work that is to be removed prior to completion of the contract.

**401.5.4 Moisture Content.** The bituminous mixture, when sampled and tested in accordance with AASHTO T 329, shall contain no more than 0.5 percent moisture by weight of the mixture.

**401.5.5 Contamination.** The bituminous mixture shall not be contaminated with deleterious agents such as unburned fuel, objectionable fuel residue or any other material not inherent in the job mix formula.

**401.6 Field Laboratory.** The contractor shall provide a Type 3 field laboratory in accordance with [Sec 601](#). The contractor may use the equipment provided in the Type 3 laboratory as long as adequate space is provided for the engineer's work.

#### **401.7 Construction Requirements.**

**401.7.1 Weather Limitations.** Bituminous mixtures shall not be placed on any wet surface or frozen pavement. Temperatures shall be obtained in accordance with MoDOT Test Method TM 20.

**401.7.2 Bituminous Mixing Plants.** Bituminous mixing plants and preparation of material and mixtures shall be in accordance with [Sec 404](#).

**401.7.3 Subgrade or Surface Preparation.** The subgrade upon which the bituminous mixture is to be placed shall be prepared in accordance with [Sec 209](#) and primed as specified in the contract in accordance with [Sec 408](#), as applicable. All material requirements of a tacked surface shall be in accordance with [Sec 407](#).

**401.7.3.1 Base Widening.** For base widening work, the bottom of the trench shall be compacted until further consolidation is not visually evident, by use of a trench roller having a weight of no less than 300 psi of width of rear roller, or by mechanical tampers or other methods approved by the engineer. Suitable excavated material may be used in shouldering operations. On the outside of curves, the design depth of trench at the beginning of the superelevation transition shall be varied gradually to the minimum depth at the end of the superelevation transition. Slight transitioning of the width of the base widening will be necessary to permit the indicated angle of repose or shear angle outside of the ultimate edge of surface. The bottom of the trench shall in no case be less than 3 inches below the surface of the existing pavement. All surplus excavated material shall be disposed of by the contractor in areas to be secured by the contractor beyond the right of way limits. An acceptable written agreement with the property owner on whose property the material is placed shall be submitted to the engineer.

**401.7.3.2 Application of Prime or Tack.** Application of prime or tack shall be in accordance with [Sec 403.12](#).

**401.7.4 Hauling Equipment.** Trucks used for hauling bituminous mixtures shall be in accordance with [Sec 404](#).

**401.7.5 Spreading.** The base course, tacked or primed surface, or preceding course or layer shall be cleaned of all dirt, packed soil or any other foreign matter prior to spreading the bituminous mixture. The mixture shall be spread in the number of layers and in the quantity required to obtain the compacted thickness and cross section shown on the plans. When placing multiple layers with varying thicknesses, the thicker layer shall be placed first.

**401.7.5.1 Irregularities.** The mixture shall be spread without tearing the surface and struck off such that the surface is smooth and true to cross section, free from all irregularities, and of uniform density throughout. Care shall be used in handling the mixture to avoid segregation. Areas of segregated mixture shall be removed and replaced with a suitable mixture at the contractor's expense. The outside edge alignment shall be uniform. Irregularities shall be corrected by adding or removing mixture before compacting. In situations where there is a dispute in the existence of segregation, the area in question will be tested in accordance with MoDOT Test Method TM 75. Mixture production shall immediately cease if either criteria of MoDOT Test Method TM 75 fail. Segregated mixtures shall be removed and replaced to the limits determined by the engineer.

**401.7.5.2 Leveling Course.** If required by the contract, a leveling course consisting of a layer of variable thickness shall be spread to the desired grade and cross section to eliminate irregularities in the existing surface. Spot-leveling operations over small areas, with feather-edging at high points and ends of spot areas, may be required prior to placing the leveling course. Rigid control of the placement thickness of the leveling course will be required. The mixture shall be practically free from segregation.

**401.7.5.3 Base Widening.** The specified total thickness of base widening shall be completed to the adjacent

traveled way elevation as shown on the plans. Additional thickness of base widening may be placed as required prior to coldmilling, at the contractor's expense, and shall subsequently be coldmilled to the same elevation as the traveled way, if conducive to expedite operations. On base-widening work, a succeeding layer of bituminous mixture may be placed the same day as the previous layer, if it can be shown that the desired results are being obtained. On small areas, and on areas that are inaccessible to mechanical spreading and finishing equipment, the mixture may be spread and finished by hand methods if permitted by the engineer. At least one lane of the existing pavement and the adjacent shoulder shall be kept open to traffic at all times during construction, except for short intervals when the movement of the contractor's equipment will seriously hinder the flow of traffic. Intervals during which the contractor will be allowed to halt traffic shall be as designated by the engineer. The contractor shall not open more trenches ahead of the first layer of the base widening than is necessary for placing that layer in one half a day's operations. The first layer of the base widening shall not be placed for a greater distance ahead of the second layer than is necessary for placing the second layer in one half a day's operations. The second layer shall not be placed for a greater distance ahead of the final layer than is necessary for placing the final layer in one day's operation. Any changes in these lengths shall be made only with written permission from the engineer.

**401.7.5.4 Edge Differential.** For roadways constructed under traffic, no pavement edge differential shall be left in place for more than seven days, unless approved by the engineer.

**401.7.6 Joints.** The minimum density of all traveled way pavement within 8 inches of a longitudinal joint, shall be no less than 2.0 percent below the specified density. The cores taken to evaluate this area shall be centered 6 inches from the longitudinal joint. If no deficient cores are found in the first 25 percent of production, the established rolling procedure may be used, at the direction of the engineer, in lieu of density tests provided no changes in the material, typical location or temperatures are made. Pay adjustments due to longitudinal joint density shall apply to the full width of the lane paved. Adjustments due to joint density shall apply to the day's production from which the cores are obtained. Transverse joints shall be formed by cutting back on the previous run to expose the full depth of the layer. When a transverse vertical edge is to be left in place and opened to traffic, a temporary depth transition shall be constructed as approved by the engineer. The longitudinal joints in one layer shall offset those in the layer immediately below by approximately 6 inches. The joints in the final surface layer shall be at the lane lines of the traveled way, except that the placement width shall be adjusted such that pavement marking shall not fall on a longitudinal joint. Each side of the joint shall be flush and along true lines.

**401.7.7 Surfaced Approaches.** At locations designated in the contract or as specified by the engineer, approaches shall be primed in accordance with [Sec 408](#) and surfaced with a plant mix bituminous mixture. The bituminous surface shall be placed as shown on the plans or as directed by the engineer. Approaches shall not be surfaced before the surface course adjacent to the entrance is completed. No direct payment will be made for any work required to condition and prepare the subgrade on the approaches.

**401.7.8 Compaction.** The compacted mixture shall have a minimum density of 92 percent of the theoretical maximum specific gravity. Density will be determined by the direct transmission nuclear method in accordance with MoDOT Test Method TM 41 or by a specific gravity method. When the contractor elects to place a lift of mixture greater than six times the nominal maximum aggregate size, cores shall be cut in half and the density of each half determined separately. In lieu of density requirements, mixtures used for wedging, transitions, existing shoulder overlays, new shoulders constructed on a sub-grade or base that does not specify density control, temporary bypasses to be maintained at the expense of the contractor, and areas where a commercial mixture is used shall be thoroughly compacted by at least three complete coverage's over the entire area with either a pneumatic tire roller weighing no less than 10 tons, a tandem-type steel wheel roller weighing no less than 10 tons or an approved vibratory roller. Rolling shall be performed at proper time intervals on each layer and shall be continued until there is no visible evidence of further consolidation.

**401.8 Quality Control.** The contractor shall maintain equipment and qualified personnel to perform QC field inspection, sampling and testing in accordance with applicable portions of [Sec 403](#). A QC Plan will not be required. A proposed third party for dispute resolution shall be included with the mix design submittal.

**401.8.1 Mixture Testing.** The contractor shall randomly test the mixture within the following frequencies. The gradation and the asphalt content shall be determined at least once every 1,000 tons of production or a minimum of once per day. Deleterious content shall be determined once per 5,000 tons unless quality concerns dictate more frequent testing as directed by the engineer. Gradation and asphalt content of RAP shall be determined once every 10,000 tons of production. If RAP is used and AASHTO T 308 is used to determine the asphalt

content, the binder ignition oven shall be calibrated in accordance with MoDOT Test Method TM 77. At the engineer's discretion, testing may be waived when production does not exceed 200 tons per day. The contractor shall certify the proper proportions of a previously proven mixture were used.

**401.8.2 Failing Test.** If a, deleterious content, or asphalt content test result falls outside of the specification tolerances, a review or adjustment of the plant settings and production shall be made and another sample shall be immediately taken. If the second test falls outside of the specification tolerances, production shall be immediately ceased until the mixture can be brought back into specification. If a gradation test falls between the Tolerance and Action Limits, adjustments to plant shall be made and another gradation shall be taken immediately. Plant production for the following day shall not resume until the mixture is brought back into specification when the final gradation for the day is not within tolerance. If a gradation test falls outside the Action Limit, production shall cease until the mixture is brought back into specification.

**401.8.3 Retained Samples.** One half of the contractor's sample for gradation, deleterious content, and asphalt content and all cores shall be retained for the engineer. The contractor shall retain the samples for 7 days after testing has been completed and the results accepted by the engineer.

**401.8.4 Pavement Testing.** During construction, the engineer will designate as many tests as necessary to ensure that the course is being constructed of proper thickness, composition and density. Density of the roadway shall be determined by one core obtained by the contractor at a random location selected by the engineer for every 500 tons of production. The cores from each day's production will be averaged to determine acceptance. A joint density core shall be taken from the same transverse cross section as the mat core and alternate sides. The maximum theoretical density shown on the job mix formula shall be used for this determination. Minimum 4-inch diameter cores, shall be taken the full depth of the layer to be tested. Cores tested by AASHTO T 166 shall be in accordance with [Sec 403.19.3.1.3](#). The contractor shall restore the surface from which samples have been taken immediately with the mixture under production or with a cold patch mixture acceptable to the engineer.

**401.8.5 Density Adjustment.** Payment for mixture placed at or below the required minimum density will be adjusted as follows:

| Field Density Percent of Maximum Theoretical Density | Percent of Contract Unit Price <sup>a</sup> |
|--|---|
| 91.5 or above  | 100%  |
| 91.0 to 91.4, inclusive                              | 97%   |
| 90.5 to 90.9, inclusive                              | 94%   |
| 90.0 to 90.4, inclusive                              | 90%   |
| 89.5 to 89.9, inclusive                              | 80%   |
| Below 89.5   | Remove and Replace                          |

<sup>a</sup>When adjustments are necessary, the lower percent of the contract unit price of either the pavement or joint density adjustment will apply.

**401.9 Quality Assurance.** Acceptance tests for gradation, deleterious content and asphalt content will be performed by the engineer at a minimum rate of one independent sample per 4 QC samples. A favorable comparison will be considered when a QA test is within the specification tolerances. An acceptance test for plasticity index will be performed at a minimum rate of one per project by the engineer on an independent sample taken during production. Initial testing will be performed the first week of production. When the plasticity index on an individual aggregate fraction is more than two percentage points above the value shown on the approved mix design, moisture susceptibility testing shall be required in accordance with [Sec 401.4.5](#). At least once for every five days of production, a split of the contractor's sample will be tested. If the results of the split sample are not within five percent on all sieves above the No. 200, two percent on the No. 200, within the specification ranges on the deleterious content, and within 0.5 percent on the asphalt content from the contractor's results, another split sample will be taken jointly with the contractor and tested. If the second test results do not compare within the specification tolerances, production shall cease until the discrepancy is resolved. If the second test results compare within the above tolerances, production may continue. The engineer will retain one half of the plasticity index test and moisture susceptibility test for 7 days after testing is complete. Results of QA testing will be furnished to the contractor within 24 hours of obtaining the sample, with the exception of moisture susceptibility testing.

**401.10 Surface Smoothness.** The finish of the pavement surface shall be substantially free from waves or

irregularities and shall be true to the established crown and grade. The pavement shall be thoroughly tested for smoothness by profiling or straightedging in accordance with Sec 610.

**401.11 Defective Mixture.** Any mixture showing an excess of bituminous material or that becomes loose and broken, mixed with dirt, or is in any way defective, shall be removed and replaced with a satisfactory mixture, which shall be immediately compacted to conform to the surrounding area.

**401.12 Pavement Marking.** If the contractor's work has obliterated existing pavement marking on resurfacing projects open to through traffic, the pavement marking shall be replaced at the contractor's expense in accordance with Sec 620.

**401.13 Method of Measurement.** Measurement will be in accordance with Sec 403.

**401.14 Basis of Payment.** The accepted quantities of plant mix bituminous pavement and base course will be paid for at the contract unit price for each of the pay items included in the contract. Payment for obtaining and delivering samples of compacted mixture from the base and replacement of the surface will be made per sample at the fixed contract unit price specified in Sec 109. No direct payment will be made for QC cores, excavating the trench for base widening, or for hauling and disposing of excess excavation material.

## SECTION 806 POLLUTION, EROSION AND SEDIMENT CONTROL

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

**806.2 Schedule of Work.** Prior to the preconstruction conference and the start of construction, the contractor shall submit schedules for the implementation of temporary pollution control and temporary and permanent erosion control work, as applicable, for construction operations. The contractor's schedule shall address specifically the pollution and erosion control measures planned at all streams or other bodies of water. No work shall start until the pollution and erosion control schedules and methods of operations have been approved by the engineer. Any delay of the work resulting from failure to submit acceptable pollution and erosion control schedules and methods of operations will be considered nonexcusable.

**806.3 Material.** All material shall be in accordance with Division 1000, Material Details, and specifically as herein.

**806.4 Construction Requirements.** The engineer will limit the surface area of erodible earth material exposed by clearing and grubbing or by excavation, borrow and fill operations in accordance with the following. The engineer may direct the contractor to provide immediate permanent or temporary pollution control measures to prevent contamination of adjacent streams or other bodies of water. Such work may involve the construction of temporary berms, dikes, dams, sediment basins and slope drains, and use of temporary mulches, seeding or other control devices or methods as necessary to control erosion and pollution.

**806.4.1** If erosion and sediment control measures, as shown on the plans, are not suitable due to site conditions, a suitable system of Best Management Practices (BMP) as defined by the applicable Missouri State Operating Permit for land disturbance activities and the Stormwater Pollution Prevention Plan (SWPPP), shall be applied as approved by the engineer.

**806.4.2** The contractor shall exercise effective management practices throughout the life of the project to control pollution. Pollutants such as chemicals, fuels, lubricants, bitumen, raw sewage or other harmful material shall not be discharged on or from the project. Temporary pollution control measures, such as storage and handling of petroleum products and other pollutants, shall be coordinated with temporary and permanent erosion and sediment control features specified in the contract to ensure economical, effective and continuous erosion and pollution control. These requirements will also apply to work within easements designated by the Commission.

**806.4.3** The contractor shall incorporate all permanent erosion, sediment, and pollution control features into the project at the earliest practical time. Temporary measures shall be used to correct conditions that develop during construction which were not foreseen during the design stage, that are needed prior to installation of permanent pollution control features, or that are needed temporarily to control erosion and sediment that develops during normal construction practices, but are not associated with permanent control features on the project.

**806.4.4** Installation of temporary control measures shall be scheduled to coincide with clearing and grubbing operations, but before grading operations begin. The project land area disturbance shall not exceed one acre without installation of erosion and sediment controls. The total project land disturbance area shall not exceed 20 acres without written approval from the engineer.

**806.4.5** The engineer may allow additional land disturbance acreage if appropriate BMP's including temporary seeding and mulching, have been applied to previously disturbed areas and the contractor has the resources to apply the BMP's to the expanded area.

**806.4.6** Unless otherwise provided or approved in writing by the engineer, construction operations in streams or other bodies of water shall be restricted to those areas that must be entered for the construction of temporary or permanent structures. Streams or other bodies of water shall be promptly cleared of all falsework, piling, debris or other obstructions placed therein or caused by construction operations.

**806.4.7** Fording of streams or other bodies of water with construction equipment will not be permitted, except as allowed by the engineer. Temporary bridges or other structures shall be used when frequent crossing of streams or other bodies of water is necessary. Unless otherwise approved in writing by the engineer, mechanized

equipment shall not be operated in streams or other bodies of water except as may be required to construct channel changes and temporary or permanent structures. If a Corps of Engineer Section 404 or Department of Natural Resources Section 401 permit is applicable for a project, the permit requirements and conditions will prevail.

**806.4.8** The contractor shall obtain all necessary permits for all project support activities located off the project site. Project support activities include, but are not limited to, borrow areas, waste areas, plant sites, and staging areas. All costs associated with the permits and pollution control shall be at the contractor's expense, including providing, installing, maintaining, and removal of all erosion and sediment control devices, and final stabilization of disturbed areas.

**806.4.9** In the event of conflict between these requirements and the pollution control laws, rules or regulations of other federal, state or local agencies, the more restrictive laws, rules or regulations will apply.

**806.4.10** The contractor is encouraged to incorporate mulch from the clearing and grubbing operation into the BMP's on the project. BMP's may consist of compost filled socks, compost filter berms, soil protection cover or any other method as approved by the engineer.

**806.4.11** Unless otherwise specified, or directed by the engineer, all temporary erosion and sediment control measures shall be removed by the contractor after permanent erosion and sediment control measures are established and the project has achieved final stabilization as defined in the SWPPP. Biodegradable erosion and sediment control materials may be allowed to be incorporated into the project in accordance with the SWPPP, as approved by the engineer. Rock from ditch checks and other temporary sediment devices may be repositioned to serve as ditch liner in accordance with the SWPPP, and as directed by the engineer.

**806.4.12** Portland cement concrete residue and wash water and other operations that produce sediment laden runoff shall be managed by an appropriate control measure.

**806.4.12.1** Portland cement concrete residue and wash water shall be discharged into a plastic lined pit, plastic lined straw bale enclosure, or other commercially available water tight enclosure suitable for containing concrete residue and wash water as approved by the Engineer.

**806.4.12.2** Water from aggregate washing and other operations that produce sediment laden water shall be treated by filtration, settling basins, or other means sufficient to comply with the general water quality criteria established by MDNR.

**806.4.12.3** No direct payment will be made for the design, installation, maintenance or removal of controls necessary to contain Portland cement concrete residue and wash water or other water from sediment producing operations.

## **SECTION 806.10 TEMPORARY BERMS.**

**806.10.1 Description.** This work shall consist of constructing and maintaining temporary berms at the top of slopes or transverse to the centerline of fills as shown on the plans.

**806.10.2 Material.** Type B berms shall consist of graded material from within the project limits, rock, or other suitable material approved by the engineer. Type C berms shall consist of rock with a predominant size between 4 inches and 12 inches.

**806.10.3 Construction Requirements.** Temporary berms shall be constructed and maintained to the approximate dimensions shown on the plans.

**806.10.3.1 Type B Berms.** Type B berms shall be machine compacted with a minimum of three passes over the entire width of the berm. Material removed from Type B berms shall be incorporated in the embankment when possible. The contractor shall remove and dispose of any excess or unsuitable material to a location approved by the engineer.

**806.10.3.1** Type B berms shall drain to a compacted outlet at slope drain. On transverse berms, the top width of the berms may be wider and the side slopes flatter to allow equipment to pass over these berms with minimal disruption.



**806.10.3.2 Type C Berms.** Vegetative mulch, erosion control blanket or geotextile fabric shall be placed on the upslope of the Type C berm. The vegetative mulch shall be placed in such a manner that the final compacted thickness is 2 inches. The material for the vegetative mulch shall be in accordance with Sec 802. The straw layer erosion control blanket or geotextile fabric shall be removed and replaced as directed by the engineer.

**806.10.4 Method of Measurement.** Measurement of Type B and C berms will be made to the nearest linear foot.

**806.10.5 Basis of Payment.** The accepted quantities of Type B and C berms will be paid for at the contract unit price and will be considered full compensation for material, installation, maintenance, removal and any other hand work necessary to construct the berms. No payment will be made for the straw layer, erosion control blanket or geotextile fabric on the Type C berm. No payment will be made for any seeding and mulching needed after removal.

## **SECTION 806.20 TEMPORARY SLOPE DRAINS.**

**806.20.1 Description.** This work shall consist of furnishing, constructing maintaining and removing temporary slope drains to carry water down slopes and to reduce erosion. The method selected shall be approved by the engineer prior to construction.

**806.20.2 Construction Requirements.** The contractor shall provide temporary, impermeable slope drains to carry water or water with suspended solids down fill slopes until permanent erosion control measures are established. The contractor shall provide temporary slope drains on fillslopes at approximately 500-foot intervals or as directed by the engineer. All temporary slope drains shall be adequately anchored to the slope to prevent disruption of flow. The inlet ends shall include a ditch check and be constructed to channel water into the temporary slope drain. Outlet ends shall have some means of dissipating the energy of the water to reduce erosion downstream and have the ability to capture sediment. After removal, the contractor shall restore the site of the slope drains to the satisfaction of the engineer.

**806.20.3 Method of Measurement.** Measurement of temporary slope drains will be made to the nearest linear foot.

**806.20.4 Basis of Payment.** The accepted quantities of temporary slope drains will be paid for at the contract unit price. Payment shall include furnishing, constructing, maintaining and removing temporary slope drains, and restoration of the slope drain sites. No payment will be made for any seeding and mulching needed after removal.

## **SECTION 806.30 TEMPORARY DITCH AND INLET CHECKS.**

**806.30.1 Description.** This work shall consist of furnishing, constructing, maintaining, removing and disposing of temporary ditch and inlet checks.

### **806.30.2 Construction Requirements.**

**806.30.2.1 Rock Ditch Checks.** Rock ditch checks shall be constructed in accordance with the plans, or as directed by the engineer, and shall have a minimum effective height of 18 inches. The predominant size of the rock used shall range between 4 inches and 12 inches.

**806.30.2.2 Alternate Ditch Checks.** Alternate ditch checks shall be constructed in accordance with the manufacturer's specifications, and as shown on the plans, or as directed by the engineer. Alternate ditch checks shall have a minimum effective height of 9 inches, shall follow guidance provided in the SWPPP, and shall perform to the level that meets or exceeds the requirement of the current Missouri Operating Permit.

**806.30.2.2.1** Unless otherwise disallowed, the contractor has the option to construct rock ditch checks in lieu of alternate ditch checks. Rock ditch checks constructed in lieu of alternate checks shall have a minimum effective height of 18 inches. Spacing shall be increased, as determined by the engineer, to account for the additional height of rock ditch check. The toe-to-top capacity requirements shown on the plans will be used to determine the spacing.

**806.30.2.3 Inlet Checks.** Inlet checks shall be installed in accordance with the plans or as directed by the engineer to prevent sediment from entering drop inlets, manholes, and other openings to culverts and closed drainage systems.

**806.30.2.3.1** Inlet checks shall be constructed in accordance with Sec 806.30.2.1, rock ditch checks, and shall completely surround the inlet or other structure, as indicated on the plans. Other allowable methods of protecting inlets will be listed in the SWPPP.

**806.30.2.4 Curb Inlet Checks.** Curb inlet checks shall consist of socks filled with rock, or other fillers of sufficient weight to keep the device in place. Curb inlet checks shall be installed in the gutter or as shown on the plans. Other proprietary devices may be used, as approved by the engineer.

**806.30.3 Maintenance.** The contractor shall monitor the condition of all temporary checks and repair or replace checks that are not functional. The contractor shall remove sediment in accordance with Sec 806.110. Alternate ditch checks shall be maintained in accordance with this provision and the manufacturer's specifications or as directed by the engineer.

**806.30.4 Removal.** All types of temporary checks shall remain in service until removal has been approved by the engineer. Removal shall be in accordance with Sec 806.4.11 and as stated herein. The contractor shall remove any sediment from the check, remove the check, and restore the area to match existing ground condition. When necessary, seeding and mulching shall be in accordance with Secs 802 and 805 respectively, and shall be considered incidental.

#### **806.30.5 Method of Measurement.**

**806.30.5.1** Measurement of rock ditch checks will be made to the nearest linear foot as measured along the top of the check. Rock ditch checks constructed in lieu of alternate checks will be included in this measurement for payment. Inlet checks, except for curb inlet checks, will be included in this measurement for payment.

**806.30.5.2** Measurement of alternate ditch checks will be made to the nearest linear foot as measured along the top of the check.

**806.30.5.3** No measurement will be made for any portion of a check that exceeds the length necessary to adequately span the ditch as shown on the plans or as directed by the engineer.

**806.30.5.4** Measurement of curb inlet checks will be made per each check.

#### **806.30.6 Basis of Payment.**

**806.30.6.1** The accepted quantities of rock ditch checks, alternate ditch checks, inlet checks, and curb inlet checks will be paid for at the contract unit price for each pay item included in the contract. If the engineer determines unusual conditions warrant complete replacement of a check, payment will be made for the replacement check at the contract unit price.

**806.30.6.2** Payment for sediment removal shall be in accordance with Sec 806.110.

### **SECTION 806.40 SEDIMENT BASINS.**

**806.40.1 Description.** This work shall consist of constructing and maintaining temporary or permanent sediment basins as shown on the plans or as directed by the engineer. This work shall include clearing and excavation to construct the basin, disposal of excavated material, and providing and installing rock or other stabilizing material as approved by the engineer. For temporary basins, removal, backfilling, and site restoration is also included in the work.

**806.40.2 Construction Requirements.** The sediment basin shall be an excavated or dammed storage area with defined side slopes. Inlet and outlet areas shall be lined with rock of sufficient size to withstand the water flow. In lieu of rock, other allowable liners may be used as described in the SWPPP. Outlets may be constructed with a riser pipe, surface skimmers, or stabilized spillway, or a combination of one or more of these features.

**806.40.2.1** The inlet of a sediment basin shall be constructed with a wide cross-section and a minimum grade to

prevent turbulence and to allow deposition of soil particles.

**806.40.2.2** Sediment shall be removed and disposed in accordance with Sec 806.110, and before the depth reaches approximately one-half the original depth of the sediment basin in any part of the pool.

**806.40.2.3** Temporary sediment basins shall remain in service until removal has been approved by the engineer. Removal shall be in accordance with Sec 806.4.11 and as stated herein. The contractor shall remove any sediment from the basin, backfill, compact all excavations, restore the area to match existing ground conditions, and seeding and mulching in accordance with Secs 802 and 805 respectively.

#### **806.40.3 Method of Measurement.**

**806.40.3.1** Measurement of excavation to construct sediment basin will be made to the nearest tenth of a cubic yard.

**806.40.3.2** Measurement of rock placed to construct sediment basins will be made to the nearest tenth of a cubic yard.

#### **806.40.4 Basis of Payment.**

**806.40.4.1** The accepted quantities for excavation to construct sediment basins will be paid for at the contract unit price. Payment includes clearing, excavation, removal, backfilling and final grading.

**806.40.4.2** The accepted quantity for rock used to construct sediment basins will be paid for at the contract unit price. Payment shall include furnishing, placing, and removal of rock.

**806.40.4.3** No direct payment will be made for seeding and mulching necessary to restore the area after removal.

**806.40.4.4** Payment for sediment removal shall be in accordance with Sec 806.110.

### **SECTION 806.50 TEMPORARY SEEDING AND MULCHING.**

**806.50.1 Description.** This work shall consist of furnishing and applying fertilizer, seed, vegetative mulch or other acceptable cover, in disturbed areas authorized by the engineer. Temporary seeding and mulching is utilized to establish a quick ground cover that reduces erosion in disturbed areas where staging requires the area to be disturbed again at a later date, and for areas that are complete but current seasonal conditions are not favorable for applying permanent seeding. Finish grading will not be required except for areas that will not receive further grading prior to permanent seeding. Hydraulic seeding and fertilizing in accordance with Sec 805 will be permitted.

**806.50.2 Construction Requirements.** Seeding and mulching shall be a continuous operation on all cut and fillslopes, excess material sites and borrow pits during the construction process. All disturbed areas shall be seeded and mulched as necessary to control erosion. When a project is shown in the contract to be constructed in stages and operations in those staged areas are suspended for a significant amount of time, the contractor shall receive payment for temporary seed and mulch. When the engineer allows the contractor to disturb additional ground beyond the restrictions in Sec 806.4.4 solely to enhance the contractor's operation, the contractor shall not receive compensation for temporary seed or mulch, as required by the engineer, for ground cover for areas exceeding the restrictions in Sec 806.4.4.

**806.50.2.1** The contractor shall provide permanent seeding and mulching as shown on the plans following temporary seeding. Any preparation of the seed bed that might be necessary prior to permanent seeding shall be considered incidental to temporary seeding.

**806.50.2.2** Temporary seeding mixtures of cereal grains shall be applied at a minimum rate of 100 pounds per acre. All erodible seeded areas shall provide a minimum of 20 plants of the species planted per square foot on at least two random counts per acre in representative areas of the field. For areas with a large percentage of rock, the number of living plants shall be proportional to the percentage of erodible surface, as determined by the engineer. The counts will be conducted 60 days after the species is planted.

**806.50.2.3** Mulch placed over temporary seed mixtures shall be applied in accordance with Sec 802.

**806.50.2.4** Fertilizer shall be applied at a rate of 40 pounds nitrogen (N) per acre.

**806.50.2.5** Lime will not be required for temporary seeding.

**806.50.3 Method of Measurement.** Measurement of temporary seeding areas will be made to the nearest tenth of an acre. No measurement will be made for mulch.

**806.50.4 Basis of Payment.** The accepted quantities of temporary seeding will be paid for at the contract unit price per acre. Payment for fertilizer and mulch shall be included in the cost of temporary seeding.

## **SECTION 806.60 SEDIMENT TRAP.**

**806.60.1 Description.** This work shall consist of constructing, maintaining and removing sediment traps as shown on the plans or as directed by the engineer.

### **806.60.2 Construction Requirements.**

**806.60.2.1** Sediment traps shall be constructed as shown on the plans or as directed by the engineer. Traps may require excavation, or placement of rock of sufficient size to impound water, or a combination of excavation and placement of rock.

**806.60.2.2** Sediment traps shall be installed with clearing and grubbing operations or as directed by the engineer. The contractor shall monitor sediment levels and remove sediment in accordance with Sec 806.110.

**806.60.2.3** Sediment traps shall remain in service until removal has been approved by the engineer. Removal shall be in accordance with Sec 806.4.11 and as stated herein. The contractor shall remove any sediment from the trap, backfill, compact all excavations, restore the area to match existing ground condition, and seeding and mulching in accordance with Secs 802 and 805 respectively.

### **806.60.3 Method of Measurement.**

**806.60.3.1** Measurement of excavation to construct sediment traps will be made to the nearest tenth of a cubic yard.

**806.60.3.2** Measurement of rock placed to construct sediment traps will be made to the nearest tenth of a cubic yard.

### **806.60.4 Basis of Payment.**

**806.60.4.1** The accepted quantity for excavation to construct sediment traps will be paid for at the contract unit price. Payment includes clearing, excavation, removal, backfilling, and final grading.

**806.60.4.2** The accepted quantity for rock used to construct sediment traps will be paid for at the contract unit price. Payment shall include furnishing, placing, and removal of rock.

**806.60.4.3** No direct payment will be made for seeding and mulching necessary to restore the area after removal.

**806.60.4.4** Payment for sediment removal will be in accordance with Sec 806.110.

## **SECTION 806.70 SILT FENCE.**

**806.70.1 Description.** This work shall consist of furnishing, installing, maintaining, and removing of a silt fence to control sediment along slopes and other designated areas. The quantity of silt fence shown on the plans may be increased or decreased, as directed by the engineer. The engineer may also modify the location as necessary to improve the effectiveness of the silt fence. Variations in quantity and location will not be considered as a change in work.

**806.70.2 Material.** When geotextile fabric is used, material shall be in accordance with Sec 1011. All other material shall be as specified in the SWPPP.

**806.70.2.1 Posts.** Wood, steel or synthetic posts may be used. Posts shall be of sufficient length, but no less than 4 feet, to ensure adequate embedment while fully supporting the fence and shall have sufficient strength to resist damage during installation and to support applied loads while in service.

**806.70.2.2 Prefabricated Fence.** Prefabricated fence systems may be used if the systems meet all of the above material requirements.

### **806.70.3 Construction and Maintenance Requirements.**

**806.70.3.1 Fabric Fence.** The contractor shall install silt fence as shown on the plans and at other locations directed by the engineer. Fence construction shall be adequate to handle the stress from hydraulic and sediment loading. Fabric at the bottom of the fence shall be buried a minimum of 6 inches to prevent flow under the barrier. The trench shall be backfilled, and the soil compacted over the fabric. Fabric splices with a minimum 2-foot overlay shall be located only at a support post. Any installation method acceptable to the engineer will be allowed as long as the effectiveness and intent of the silt fence is achieved.

**806.70.3.1.1** Post spacing shall not exceed 5 feet. Posts shall be driven a sufficient depth into the ground or placed on closer spacing as necessary to ensure adequate resistance to applied loads.

**806.70.3.1.2** The silt fence shall be fastened securely to the upslope side of the post. When wire support fence is used, the wire shall extend into the trench a minimum of 2 inches.

**806.70.3.2 Alternate Fence Types.** Alternate silt fence types shall be in accordance with the SWPPP or as approved by the engineer.

**806.70.3.3 Maintenance.** The contractor shall monitor the condition of all fences and repair or replace fences that are not functional as long as the fences are necessary to contain sediment runoff. Any deficiencies shall be corrected by the contractor in accordance with the SWPPP. In addition, the contractor shall review the effectiveness of silt fences in areas where construction activities have changed the natural contour and drainage runoff. Where deficiencies exist, additional silt fences shall be installed as approved or directed by the engineer.

**806.70.3.4 Sediment.** The contractor shall remove and dispose of sediment in accordance with Sec 806.110. Segments of silt fence that receive heavy sediment loading may require a secondary silt fence or installation of other controls to adequately contain sediment.

**806.70.3.5 Removal.** Silt fence shall be removed in accordance with Sec 806.4.11 and as specified herein. The contractor shall remove and dispose of any excess silt accumulation along the fence, shall restore the area to match existing ground condition, and seeding and mulching in accordance with Secs 802 and 805 respectively.

**806.70.4 Method of Measurement.** Silt fence will be measured to the nearest linear foot from end to end of each separate installation.

### **806.70.5 Basis of Payment.**

**806.70.5.1** The accepted quantities of silt fence will be paid for at the contract unit price.

**806.70.5.2** No direct payment will be made for seeding and mulching necessary to restore the area after removal.

**806.70.5.3** Payment for sediment removal will be in accordance with Sec 806.110.

## **SECTION 806.80 TEMPORARY PIPE.**

**806.80.1 Description.** This work shall consist of installing and removing temporary pipe utilized to carry water under temporary roadways, silt fences, berms or other locations determined by the engineer and to prevent the contractor's equipment from coming in direct contact with water when crossing an active stream, intermittent streams created during heavy rainfalls or other bodies of water.

**806.80.2 Material.** Any pipe approved by the engineer may be used.

**806.80.3 Construction Requirements.** Installation of temporary pipe shall be in accordance with the specifications for permanent pipe and shall prevent water from causing erosion around the pipe. All backfill material for pipes shall be placed in 6-inch lifts and mechanically compacted. Compaction tests will not be required. Temporary pipe placed in intermittent or active streams shall be backfilled with clean rock of sufficient size to withstand normal stream flows.

**806.80.4 Method of Measurement.** Measurement of temporary pipe will be made to the nearest linear foot for those pipes specified on the plans.

**806.80.5 Basis of Payment.** The accepted quantities of temporary pipe will be paid for at the contract unit price for temporary pipes specified on the plans. No payment will be made for temporary pipes that the contractor chooses to install to facilitate construction. Unless provided as a pay item in the contract documents, no direct payment will be made for the placement and removal of the backfill material or rock.

## **SECTION 806.90 EROSION CONTROL BLANKETS AND TURF REINFORCEMENT MATS.**

**806.90.1 Description.** This work shall consist of furnishing and placing erosion control blankets (ECBs) and turf reinforcement mats (TRMs) on slopes or ditches for short-term or long-term protection of seeded areas at locations shown on the plans or as directed by the engineer.

**806.90.2 Material.** ECBs and TRMs shall be used as designated in the contract or as approved by the engineer. The contractor shall provide ECBs and TRMs of the type specified in the contract and shall provide a manufacturer's certification stating that they are in accordance with Sec 1011.

**806.90.3 Construction Requirements.** ECBs and TRMs shall be installed and maintained according to the manufacturer's recommendations.

**806.90.4 Method of Measurement.** Measurement of ECBs and TRMs will be made to the nearest square yard of surface area covered.

**806.90.5 Basis of Payment.** The accepted quantity of ECBs and TRMs will be paid for at the contract unit price for each of the pay items included in the contract. If ECBs and TRMs are used in lieu of other erosion control measures, payment will be made at the contract unit price for the pay items in the contract for the respective items that the blanket replaces.

## **SECTION 806.100 TEMPORARY STREAM CROSSING.**

**806.100.1 Description.** This work shall consist of constructing a temporary stream crossing to facilitate the movement of equipment across a stream.

**806.100.2 Construction Requirements.** The contractor shall be responsible for the design, installation, maintenance and removal of the temporary stream crossing and any structures installed for the construction of the temporary stream crossing. Appropriate measures shall be taken to maintain near normal downstream flows and to minimize flooding upstream. The temporary stream crossing shall be constructed to permit the free movement of the stream's aquatic life. Fill material shall be clean rock of sufficient size to withstand expected high flows. Only graded rock and/or quarry-run rock shall be used. The rock must be reasonably well graded, with no particle dimension greater than approximately 12 inches, and no particle dimension less than approximately 9 inches. Gravel and dirt should not exceed 15% of the total fill volume.

**806.100.2.1** Prior to construction of the temporary stream crossing, all information shall be submitted to the engineer to ensure that it meets the terms and conditions of the Corps of Engineer permit. The contractor shall not begin construction on any temporary stream crossing without written permission from the engineer.

**806.100.2.2** All approaches to the temporary stream crossing shall be maintained such that all storm water runoff is diverted to retention devices.

**806.100.2.3** When the temporary stream crossing is no longer needed, the crossing shall be removed as soon as

possible and the area shall be restored to pre-project conditions or to the satisfaction of the engineer.

**806.100.3 Basis of Payment.** No direct payment will be made for the design, installation, maintenance or removal of temporary stream crossings. The contractor shall be responsible for all costs, including damage and penalties.

#### **SECTION 806.110 SEDIMENT REMOVAL.**

**806.110.1 Description.** This work shall consist of removing and disposing of sediment from sediment control devices, such as ditch and inlet checks, sediment basins, sediment traps, silt fence, and other devices that accumulate sediment.

**806.110.2 Construction Requirements.** The contractor shall monitor sediment levels in all sediment control devices and remove sediment prior to the level reaching approximately one-half the design heights for checks and fences, and one-half the storage capacities for basins and traps. The engineer may require sediment removal from devices prior to levels reaching the specified limits.

**806.110.2.1** The contractor shall dispose of the sediment in a location that does not allow the sediment to erode back into the sediment devices or to pollute streams or other bodies of water.

**806.110.3 Method of Measurement.** Measurement of sediment removal will be made to the nearest tenth of a cubic yard.

**806.110.3.1** No measurement will be made for sediment removal that accumulates due to the contractor's failure to complete erosion control measures in accordance with the SWPPP or as directed by the engineer. The engineer shall determine the volume of sediment that will be excluded from payment due to a lack of required erosion control measures.

**806.110.3.2** No measurement will be made for removing any remaining sediment during final removal of the sediment control devices.

**806.110.4 Basis of Payment.** The accepted quantity of sediment removal will be paid for at the contract unit price.

STATE OF MISSOURI  
DEPARTMENT OF NATURAL RESOURCES  
MISSOURI CLEAN WATER COMMISSION

Appendix C



MISSOURI STATE OPERATING PERMIT

**General Operating Permit**

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

Permit No: MOR100038

Owner: OA-Facilities Mgmt, Design, and Construc  
Address: 301 West High Street, Hst Rm 370  
Jefferson City, MO 65101

Continuing Authority: OA Facilities Mgmt Design Construction  
301 West High St.  
Hst Rm 730  
Jefferson City, MO 65102

Facility Name: Office of Administration  
Facility Address: OA-FMDC, PO Box 809 301 W High street  
JEFFERSON CITY, MO 65102

Legal Description: Land Grant 681, Cole County  
UTM Coordinates: 571840.000/4270368.000  
Receiving Stream: Various State Wide (U)  
First Classified Stream - ID#: Missouri R. (P) 701.00  
USGS# and Sub Watershed#: 10300102 - 1305

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

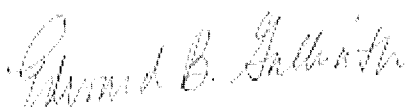
**FACILITY DESCRIPTION All Outfalls SIC #1629**

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

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


July 01, 2017

Issue Date

  
Edward B. Galbraith, Director  
Division of Environmental Quality

June 22, 2022

Expiration Date

  
David J. Lamb, Acting Director  
Water Protection Program



## APPLICABILITY

1. This general permit authorizes the discharge of stormwater and certain non-stormwater discharges from land disturbance sites that disturb one or more acres or disturb less than one acre when part of a larger common plan of development or sale that will disturb a cumulative total of one or more acres over the life of the project. This general permit also authorizes the discharge of stormwater and certain non-stormwater discharges from smaller projects where the Missouri Department of Natural Resources (department) has exercised its discretion to require a permit [10 CSR 20-6.200(1)(B)].
2. This general permit is issued to a city, county, state or federal agency or other governmental jurisdiction for land disturbance projects performed by or under contract to the permittee.
3. A general stormwater control plan or stormwater pollution prevention plan (SWPPP) must be developed prior to issuance of this permit. These plans must include a narrative of the types and appropriate uses of Best Management Practices (BMPs) for erosion and sediment control and stormwater management. All water pollution controls on land disturbance sites shall conform to the storm water control program and/or SWPPP of the city, county or other governmental jurisdiction in which the land disturbance activity is occurring. The requirements of the stormwater control program and/or SWPPP must be at least as stringent as those described in this permit and 10 CSR 20-6.200.
4. A Missouri State Operating Permit must be issued before any site vegetation is removed or the site disturbed. Any site owner/operator subject to these requirements for stormwater discharges and who disturbs land prior to permit issuance from the department is in violation of both State regulations per 10 CSR 20-6.200(1)(A) and Federal regulations per 40 CFR 122.26. The legal owner of the property, right-of-way or the holder of an easement on the property, and operator on which the site is located are responsible for compliance with this permit.
5. This permit authorizes discharges from construction support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas) provided that appropriate stormwater controls are designed, installed, maintained and provided:
  - a. The support activity is directly related to the construction site required to have permit coverage for stormwater discharges;
  - b. The support activity is not a commercial operation; and
  - c. The support activity does not continue to operate beyond the completion of the construction activity at the project it supports.The permittee is responsible for compliance with this permit for any construction support activities.
6. This permit authorizes non-stormwater discharges from the following activities provided that these discharges are addressed in the permittee's specific SWPPP required by this general permit:
  - a. Dewatering activities if there are no contaminants other than sediment present in the discharge, and the discharge is treated as specified in Requirements, Section 10.o. of this permit;
  - b. Flushing water hydrants and potable water lines;
  - c. Water only (i.e., without detergents or additives) rinsing of streets and buildings; and
  - d. Site watering to establish vegetation.
7. This general permit does not authorize the:
  - a. placement of fill materials in waters or floodplains
  - b. obstruction of stream flow,
  - c. redirection of stormwater across private property not owned or operated by the permittee, or

d. Changing the channel of a defined drainage course.

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

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

The permittee will be notified in writing of the requirement to apply for a site-specific permit or a different general permit. When issued to the authorized permittee, the applicability of this general permit to the permittee is automatically terminated upon the effective date of the site-specific or different general permit.
13. Any owner/operator authorized by a general permit may request to be excluded from the coverage of the general permit and apply for a site-specific permit [10 CSR 20-6.010(13)(D)].

14. This operating permit does not affect, remove, or replace any requirement of the National Environmental Policy Act; the Endangered Species Act; the National Historic Preservation Act; the Comprehensive Environmental Response, Compensation and Liability Act; or the Resource Conservation and Recovery Act. Determination of applicability for the above mentioned acts is the responsibility of the permittee.
15. This permit does not supersede any requirement for obtaining project approval under an established local authority.
16. This permit is not transferable to other owners or operators.

#### EXEMPTIONS FROM PERMIT REQUIREMENTS

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

#### REQUIREMENTS

1. Electronic Discharge Monitoring Report (eDMR) Submission System.  
Per 40 CFR Part 127 National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, reporting shall be submitted by the permittee via an electronic system to ensure timely, complete, accurate, and nationally-consistent set of data about the NPDES program. All general permit covered facilities under this master general permit shall comply with the department's requirements for electronic reporting.
  - a. Reporting Requirements.
    - (1) Application to participate in the department's eDMR system is required as part of the application for general permit coverage in order to constitute a complete permit application and may be accessed at [dnr.mo.gov/env/wpp/edmr.htm](http://dnr.mo.gov/env/wpp/edmr.htm).
    - (2) The permittee must electronically submit quarterly reports via the eDMR system.
  - b. Other actions. The following shall be submitted electronically after such a system has been made available by the department:
    - (1) General Permit Applications/Notices of Intent to discharge (NOIs);
    - (2) Notices of Termination (NOTs);
    - (3) No Exposure Certifications (NOEs); and
    - (4) Low Erosivity Waivers and Other Waivers from Stormwater Controls (LEWs).
  - c. Electronic Submissions. To access the eDMR system, use the following web link: <https://edmr.dnr.mo.gov/edmr/E2/Shared/Pages/Main/Login.aspx>.
  - d. Waivers from Electronic Reporting.
    - (1) The permittee must electronically submit reports unless a waiver is granted by the department in compliance with 40 CFR Part 127.
    - (2) The permittee may obtain a temporary or permanent electronic reporting waiver by first submitting an eDMR Waiver Request Form (Form 780-2692: <http://dnr.mo.gov/forms/780-2692-f.pdf>, by contacting the appropriate permitting office or emailing [edmr@dnr.mo.gov](mailto:edmr@dnr.mo.gov)). The department will either approve or deny this electronic reporting waiver request within 120 calendar days of receipt.
    - (3) Only permittees with an approved waiver request may submit reports on paper to the Department for the period that the approved electronic reporting waiver is effective.
2. Quarterly Reports: Permittees shall prepare a quarterly report with a list of active land disturbance sites including any off-site borrow or depositional areas associated with the construction project

and submit the following information electronically as an attachment to the eDMR system until such a time when the current or a new system is available to allow direct input of the data:

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

The quarterly report(s) shall be maintained by the permittee and readily available for review by the department at the address provided on the application as well as submitted to the department quarterly via the department's eDMR system. When a permittee terminates permit coverage, the permittee shall submit with the request for termination, the final quarterly report for the current calendar quarter. The permittee shall submit quarterly reports according to Table A.

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

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

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

The purpose of the SWPPP is to ensure the design, implementation, management and maintenance of BMPs in order to prevent sediment and other pollutants in stormwater discharges associated with the land disturbance activities; compliance with the Missouri Water Quality Standards; and compliance with the terms and conditions of this general permit.

The following manuals are acceptable resources for the selection of appropriate BMPs. *Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites*, (Document number EPA 833-R-06-004) published by the United States Environmental Protection Agency (USEPA) in May 2007. This manual as well as other information, including examples of construction SWPPPs, is available at the USEPA internet site at <https://www.epa.gov/npdes/developing-stormwater-pollution-prevention-plan-swppp>; and the latest version of *Protecting Water Quality: A field guide to erosion, sediment and stormwater best management practices for development sites in Missouri*, published by the department is available on the department's internet site at <http://www.dnr.mo.gov/env/wpp/wpcp-guide.htm>.

The permittee is not limited to the use of these guidance manuals. Other guidance publications may be used to select appropriate BMPs. However, all BMPs should be described and justified in the SWPPP.

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

- b. Site Map: The SWPPP must contain a legible site map showing the site boundaries and points of discharge to receiving water(s) and identifying:
  - (1) Direction(s) of stormwater flow and approximate slopes for all phases of construction activities;
  - (2) Areas of soil disturbance and areas that will not be disturbed (or a statement that all areas of the site will be disturbed unless otherwise noted);
  - (3) Location of permanent and temporary structural and non-structural BMPs identified in the SWPPP;
  - (4) Locations where stabilization practices are expected to occur;
  - (5) Locations of off-site material, waste, borrow or equipment storage areas;
  - (6) Locations of all waters of the state (including wetlands);
  - (7) Locations where stormwater discharges to a surface water; and
  - (8) Areas where final stabilization has been accomplished and no further construction-phase permit requirements apply.
- c. Site Description: In order to identify the site, the SWPPP shall include facility and points of discharge to receiving water(s) information. The SWPPP shall have sufficient information to be of practical use to contractors and site construction workers to guide the installation and maintenance of BMPs.
- d. Selection of Temporary and Permanent BMPs: The permittee shall select, install, use, operate and maintain appropriate BMPs for the permitted site and list them in the SWPPP.
- e. Preservation of trees and vegetation: The SWPPP shall require existing vegetation and trees to be preserved where practical.
- f. Surface Water Buffers: For surface waters of the state, defined as “all waters within the jurisdiction of this state, including all rivers, streams, lakes and other bodies of surface and subsurface water lying within or forming a part of the boundaries of the state which are not entirely confined and located completely upon lands owned, leased or otherwise controlled by a single person or by two or more persons jointly or as tenants in common, located on or adjacent to the site,” the permittee must comply with (1)-(3), except as noted in (4):
  - (1) Provide and maintain a 50-foot undisturbed natural buffer;
  - (2) Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer; or
  - (3) If infeasible to provide and maintain an undisturbed natural buffer of any size, implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.
  - (4) The permittee is not required to comply with (1), (2) or (3) above if one of the following exceptions apply and documentation is provided in the SWPPP:
    - (a) As authorized per Clean Water Act Section 404 Department of the Army permit and its associated Section 401 Water Quality Certification from the department.
      - 1. The angle of any crossing shall be as perpendicular as feasible to the water course or natural stream buffer to minimize adverse impacts.
    - (b) If there is no discharge of stormwater to waters of the state through the area between the disturbed portions of the site and waters of the state located within 50 feet of your site. This includes situations where you have implemented permanent control measures that will prevent such discharges, such as a berm or other barrier.
    - (c) Where no natural buffer exists due to preexisting development disturbances that occurred prior to the initiation of planning for the current development of the site.
      - 1. Where some natural buffer exists but portions of the area within 50 feet of the waters of the state are occupied by preexisting development disturbances, you are required to comply with (1), (2), or (3) above.
    - (d) For linear projects where site constraints make it infeasible to implement a buffer or equivalent provided you limit disturbances within 50 feet of any waters of the state and/or you provide supplemental erosion and sediment controls to treat stormwater

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

- (e) For small residential lot construction as defined as 'a lot being developed for residential purposes that will disturb less than 1 acre of land, but is part a larger common plan of development or sale,' one has the option of complying with (1), (2) or (3) above or one of the following alternatives:
  - 1. Tiered-technology approach where:
    - a. A 50-foot or larger buffer is retained, no additional requirements are needed,
    - b. The buffer is greater than 30 feet but less than 50 feet wide, implement double perimeter controls spaced a minimum of at least 5 feet apart between land disturbance and water of the state, or
    - c. A less than or equal to 30-foot buffer is maintained, implement double perimeter controls between land disturbance and water of the state and stabilization activities completed with 7 calendar days of temporary or permanent cessation of land disturbance; or
  - 2. Sediment discharge risk based on the site's slope, location and soil type when combined with buffer width.
- g. Measuring Buffer Width: Where the permittee is retaining a buffer of any size, the buffer should be measured perpendicularly from any of the following points, whichever is further landward from the water:
  - (1) The ordinary high water mark of the water body, defined as the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, and/or the presence of litter and debris; or
  - (2) The edge of the stream or river bank, bluff, or cliff, whichever is applicable.
- h. Description of BMPs: The SWPPP shall include a description of both structural and non-structural BMPs used one or more times at the site, providing the following general information for each:
  - (1) Physical description of the BMP;
  - (2) Site conditions that must be met for effective use of the BMP;
  - (3) BMP installation/construction procedures, including typical drawings; and
  - (4) Operation and maintenance procedures for the BMP.
- i. Specific Instance of BMPs: The SWPPP shall provide the following information for each specific instance where a BMP is to be installed:
  - (1) Whether the BMP is temporary or permanent;
  - (2) Where, in relation to other site features, the BMP is to be located;
  - (3) When the BMP will be installed in relation to each phase of the land disturbance procedures to complete the project; and
  - (4) Site conditions that must be met before removal of the BMP if the BMP is not a permanent BMP.
- j. Disturbed Areas: Slopes for disturbed areas must be defined in the SWPPP. A site map or maps defining the sloped areas for all phases of the project must be included in the SWPPP.
  - (1) For soil disturbing activities that have temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days:
    - (a) The permittee shall construct BMPs to establish interim stabilization; and
    - (b) Stabilization must be initiated immediately and completed within 14 calendar days.
  - (2) For soil disturbing activities that have been permanently ceased on any portion of the site, final stabilization of disturbed areas must be initiated immediately and completed within 14 calendar days.
  - (3) Allowances to the 14 day completion period for temporary and final stabilization may be made due to weather and equipment malfunctions. In drought-stricken areas where initiating vegetative stabilization measures immediately are infeasible, alternative stabilization measures must be employed. The use of allowances shall be documented in the SWPPP.

- (4) Interim stabilization shall consist of well-established and maintained BMPs that are reasonably certain to protect waters of the state from sediment pollution over an extended period of time. This may require adding more BMPs to an area than is normally used during daily operations. These BMPs may include a combination of sediment basins, check dams, sediment fences and mulch. The types of BMPs used must be suited to the area disturbed, taking into account the number of acres exposed and the steepness of the slopes. If the slope of the area is greater than 3:1 (three feet horizontal to one foot vertical) or if the slope is greater than 3% and greater than 150 feet in length, then the permittee shall establish interim stabilization within seven days of ceasing operations on that part of the site.
  - (5) In limited circumstances, stabilization may not be required if the intended function of a specific area of the site necessitates that it remain disturbed.
- k. Installation: The permittee shall ensure the BMPs are properly installed at the locations and relative times specified in the SWPPP.
  - (1) Peripheral or border BMPs to control runoff from disturbed areas shall be installed or marked for preservation before general site clearing is started. Note that this requirement does not apply to earth disturbances related to initial site clearing and establishing entry, exit and access of the site, which may require that stormwater controls be installed immediately after the earth disturbance.
  - (2) For phased projects, BMPs shall be properly installed as necessary prior to construction activities.
  - (3) Stormwater discharges from disturbed areas which leave the site shall pass through an appropriate impediment to sediment movement such as a sedimentation basin, sediment traps and/or silt fences prior to leaving the land disturbance site.
  - (4) A drainage course change shall be clearly marked on a site map and described in the SWPPP.
  - (5) If vegetative stabilization measures are being implemented, stabilization is considered "installed" when all activities necessary to seed or plant the area are completed.
- l. Sedimentation Basins: The SWPPP shall include a sedimentation basin for each drainage area with ten or more acres disturbed at one time.
  - (1) The sedimentation basin shall be sized to a local 2-year, 24-hour storm. A 2-year, 24-hour storm event shall be determined for the project location using the National Oceanic and Atmospheric Administration's National Weather Service Atlas 14 which can be located at <http://hdsc.nws.noaa.gov/hdsc/pfds/>.
  - (2) Basins designed and initiated under the 2012 Area-Wide Land Disturbance General Permit MO-R100038 or prior authorizations shall comply with the requirements held in those authorizations. Any construction activities designed and initiated under this authorization shall comply with the local 2-year, 24-hour storm event by January 1, 2018.
  - (3) Accumulated sediment shall be removed from the basin when basin is 50% full.
  - (4) Utilize outlet structures that withdraw water from the surface when discharging from basins and impoundments unless infeasible.
  - (5) Discharges from the basin shall not cause scouring of the banks or bottom of the receiving stream.
  - (6) The SWPPP shall require the basin be maintained until final stabilization of the disturbed area served by the basin.
  - (7) The SWPPP shall require both temporary and permanent sedimentation basins to have a stabilized spillway to minimize the potential for erosion of the spillway or basin embankment.
  - (8) Where use of a sediment basin is infeasible, the SWPPP shall evaluate and specify other similarly effective BMPs to be employed to control erosion and sediment delivery. These similarly effective BMPs shall be selected from appropriate BMP guidance documents authorized by this permit. The BMPs must provide equivalent water quality protection to achieve compliance with this permit.



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

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

- changes to the frequency of inspections, including switching between the options listed below, must be documented in the SWPPP:
- (1) At least once every seven calendar days and within 48 hours after any storm event equal to or greater than a 2-year, 24-hour storm has ceased during a normal work day and within 72 hours if the event ceases during a non-work day such as a weekend or holiday; or
  - (2) Once every 14 calendar days and within 24 hours of the occurrence of a storm event of 0.25 inches or greater or the occurrence of runoff from snowmelt. To determine if a storm event of 0.25 inches or greater has occurred on-site, the permittee must either keep a properly maintained precipitation gauge on site, or obtain the storm event information from a weather station near the site.
    - (a) Inspections shall be conducted within 24 hours once a storm event has produced 0.25 inches within a 24 hour period, even if the storm event is still continuing.
    - (b) If the permittee has elected to inspect every 14 calendar days and there is a storm event at the site that continues for multiple days, and each day of the storm produces 0.25 inches or more of rain, the permittee is required to conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the end of the storm.
18. The SWPPP must explain how the person responsible for erosion control will be notified when stormwater runoff occurs
19. Site Inspections Reports: A log of each inspection and copy of the inspection report shall be kept readily accessible and must be available upon request by the department. Electronic logs are acceptable as long as reports can be provided in a timely manner. If inspection reports are kept off-site, the SWPPP must indicate where they are stored. The inspection report shall be signed by the permittee or by the person performing the inspection if duly authorized to do so. The inspection report is to include the following minimum information:
- a. Inspector's name;
  - b. Date of inspection;
  - c. Observations relative to the effectiveness of the BMPs;
  - d. Actions taken or necessary to correct the observed problem; and
  - e. Listing of areas where land disturbance operations have permanently or temporarily stopped.
20. Notification to All Contractors: The permittee shall be responsible for notifying each contractor or entity (including utility crews and city employees or their agents) who will perform work at the site of the existence of the SWPPP and what action or precautions shall be taken while on-site to minimize the potential for erosion and the potential for damaging any BMP. The SWPPP shall contain a record of notification; for example, a list of contractors or entities given a copy of the SWPPP or education session sign-in sheet. The permittee is responsible for any damage a subcontractor may do to established BMPs and any subsequent water quality violation resulting from the damage.
21. Public Notification: The permittee shall post a copy of the public notification sign on page 15 of this permit at the main entrance to the site. The public notification sign must be visible from the public road that provides access to the site's main entrance. An alternate location is acceptable provided the public can see it and it is noted in the SWPPP. The public notification sign must remain posted at the site until the permit has been terminated.

## OTHER DISCHARGES

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

## SAMPLING REQUIREMENTS AND EFFLUENT LIMITATIONS

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

## RECORDS

1. The permittee shall retain copies of this general permit, the SWPPP and all amendments for the site, results of any monitoring and analysis, and all site inspection records. The records shall be accessible during normal business hours. The records shall be retained for a period of at least three years from the date of the Letter of Termination.
2. The permittee shall provide a copy of the SWPPP to the department, USEPA, or any local agency or government representative if they request a copy in the performance of their official duties.
3. The permittee shall provide a copy of the SWPPP to those who are responsible for installation, operation, or maintenance of any BMP. The permittee, their representative, and/or the contractor(s) responsible for installation, operation and maintenance of the BMPs shall have a current copy of the SWPPP with them when on the project site.

## LAND PURCHASE AND CHANGE OF OWNERSHIP

1. If the permittee sells any portion of the permitted site to a developer for commercial, industrial, or residential use, this land remains a part of the common sale and the new owner must obtain a permit prior to conducting any land disturbance activity. Therefore, the original permittee must amend the SWPPP to show that the property has been sold and therefore no longer under the original permit coverage.
2. Property of any size which is part of a larger common plan of development where the property has been stabilized and the original permit terminated will require application of a new land disturbance permit for any future land disturbance activity unless exempted per 10 CSR 20-6.010(1)(B), 10 CSR 20-6.200(1)(B), and 40 CFR 122.26(a)(2)(ii).
3. If the entire tract is sold to a single entity, then this permit shall be terminated when the new owner obtains a new land disturbance permit for the site.
4. If a portion of a larger common plan of development is sold to an individual for the purpose of building his or her own private residence, a permit is required if the portion of land sold is equal to or greater than one acre while no permit is required for less than one acre of land sold.

## TERMINATION

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

## DUTY TO REAPPLY

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

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

#### MODIFICATION, REVOCATION, AND REOPENING

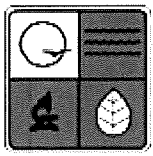
1. The full implementation of this operating permit shall constitute compliance with all applicable federal and state statutes and regulations in accordance with §644.051.16, RSMo, and the CWA section 402(k); however, this permit may be reopened and modified, or alternatively revoked and reissued to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a) (2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:
  - a. contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
  - b. controls any pollutant not limited in the permit.
2. If this permit is reopened, modified or revoked pursuant to this Section, the permittee retains all rights under Chapter 536 and 644 Revised Statutes of Missouri upon the department's reissuance of the permit as well as all other forms of administrative, judicial, and equitable relief available under law.

#### STANDARD CONDITIONS

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

1. 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.
2. 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.
3. Duty to Provide Information: The permittee shall furnish to the department, within a reasonable time, any information which the department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the department upon request, copies of records required to be kept by this permit.

4. 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.
5. Signatory Requirement:
  - a. All permit applications, reports required by the permit, or information requested by the department shall be signed and certified. (See 40 CFR 122.22 and 10 CSR 20-6.010)
  - b. The Federal Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six (6) months per violation, or by both.
  - c. The Missouri Clean Water Law provides that any person who knowingly makes any false statement, representation or certification in any application, record, report, plan, or other document filed or required to be maintained pursuant to sections 644.006 to 644.141 shall, upon conviction, be punished by a fine of not more than ten thousand dollars, or by imprisonment for not more than six months, or by both.



Missouri  
Department of  
Natural Resources

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

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

**1-800-361-4827**

**Missouri Department of Natural Resources  
Fact Sheet  
MO-R100038**

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

Per 40 CFR 124.56, 40 CFR124.8, and 10 CSR 20-6.020(1)(A)2., a Fact Sheet shall be prepared to give pertinent information regarding the applicable regulations, rationale for the development of effluent limitations and conditions, and the public participation process for the permit. A Fact Sheet is not an enforceable part of a permit.

This Fact Sheet is for a:

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

**Definitions**

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

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

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

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

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

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

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

**Permanently:** For the purposes of this permit, permanently should be defined as any activity that has been



ceased without any intentions of future disturbance.

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

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

## **Part I – Facility Information**

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

This permit establishes a SWPPP requirement to minimize pollutants of concern from this type of facility or for all facilities covered under this permit. 10 CSR 20-6.200(6)(A)7. specifies that "general permits shall contain BMP requirements and/or monitoring and reporting requirements to keep the stormwater from becoming contaminated." Local conditions are not considered when developing conditions for a general permit. A facility may apply for a site-specific permit if they desire a review of local conditions.

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

## **Part II – Receiving Stream Information**

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

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

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

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

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

### **Part III – Applicability**

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

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

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

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

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

### **Part IV – Exemptions**

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

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

### **Part V – Rationale of Technology Based Limitations & Permit Conditions**

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

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

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

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

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

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

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

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

**ANTIDEGRADATION:**

Antidegradation policies ensure protection of water quality for a particular water body on a pollutant by pollutant basis to ensure Water Quality Standards are maintained to support beneficial uses such as fish and wildlife propagation and recreation on and in the water. This also includes special protection of waters designated as an Outstanding National Resource Water or Outstanding State Resource Water [10 CSR 20-7.031(3) (C)]. Antidegradation policies are adopted to minimize adverse effects on water. The department has determined that the best avenue forward for implementing the Antidegradation requirements into general permits is by requiring the appropriate development and maintenance of a SWPPP. The SWPPP must identify all Best Management Practices (BMPs) that are reasonable and effective, taking into account environmental impacts and costs. This analysis must document why no discharge or no exposure options are not feasible at the facility. This selection and documentation of appropriate control measures will then serve as the analysis of alternatives and fulfill the requirements of the Antidegradation Rule and Implementation Procedure 10 CSR 20-7.031(3) and 10 CSR 20-7.015(9)(A)5.

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

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

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

In accordance with 40 CFR 122.44(3)(k) Best Management Practices (BMPs), BMPs are implemented to control or abate the discharge of pollutants when: (1) Authorized under Section 304(e) of the CWA for the control of toxic pollutants and hazardous substances from ancillary industrial activities; (2) Authorized under Section 402(p) of the CWA for the control of stormwater discharges; (3) Numeric effluent limitations are infeasible; or (4) The practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA.

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

Additionally in accordance with Stormwater Management, a SWPPP is a series of steps and activities to (1) identify sources of pollution or contamination, and (2) select and carry out actions which prevent or control the pollution of stormwater discharges.

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

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

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

#### **WATER QUALITY STANDARDS:**

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

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

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

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

In accordance with 40 CFR 122.44(d)(1), effluent limitations shall be placed into the permit for those pollutants which have been determined to cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality. The rule further states that pollutants which have been determined to cause, have the reasonable potential to cause, or contribute to an excursion above a narrative criterion within an applicable State water quality standard, the permit shall contain a numeric effluent limitation to protect that narrative criterion. In order to comply with this regulation, the permit writer will complete reasonable potential determinations on whether the discharge will violate any of the general criteria listed in 10 CSR 20-7.031(4). These specific requirements are listed below followed by derivation and discussion [the lettering matches that of the rule itself, under 10 CSR 20-7.031(4)]. It should also be noted that Section 644.076.1, RSMo states that it shall be unlawful for any person to cause or permit any discharge of water contaminants from any water contaminant or point source located in Missouri that is in violation of sections 644.006 to 644.141 of the Missouri Clean Water Law or any

standard, rule or regulation promulgated by the commission.

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

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

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

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

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

In order to design controls that match the sediment removal efficiency of a 50- foot buffer, first the permittee must know what this efficiency is for the site. The sediment removal efficiencies of natural buffers vary according to a number of site-specific factors, including precipitation, soil type, land cover, slope length, width, steepness, and the types of sediment controls used to reduce the discharge of sediment prior to the buffer.

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

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

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

Additional guidance may be found at [https://www.epa.gov/sites/production/files/2017-02/documents/2017\\_cgp\\_final\\_appendix\\_g\\_-\\_buffer\\_reqs\\_508.pdf](https://www.epa.gov/sites/production/files/2017-02/documents/2017_cgp_final_appendix_g_-_buffer_reqs_508.pdf).

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

## **Part VI – Effluent Limitations Determination**

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

## **Part VII – Land Purchase and Change of Ownership**

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

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

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

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

## **Part VIII – Termination**

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

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

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

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

### **Part IX – Duty to Reapply**

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

### **Part X – Standard Conditions**

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

### **Part XI – Administrative Requirements**

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

#### **PUBLIC NOTICE:**

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

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

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

☒ The Public Notice period seeking comments on this permit occurred from March 31 to May 1, 2017.

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

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